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THE PAPER TRADE JOURNAL.

"The Consumption of Paper is the Measure of a People's Culture."

VOLUME XXIII.—NO. 41. NEW YORK, OCTOBER 13, 1894. WHOLE NUMBER 1067.

Trade Topics.

Friction in Machinery.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By W. H. Weston.

Probably nothing in the line of moving machinery is of more importance than the lubrication of its running surfaces, and there is nothing more slighted and improperly done.

At least nine-tenths of the oil on the market is almost as useless for lubrication as so much water, and money is thrown away in the purchase of such impositions.

The only way to account for the purchase of these substitutes seems to be ignorance, because good judgment can easily see that good lubrication is far cheaper than inferior. In some instances the person who buys the oil for a manufactory knows full well the economy of procuring a first-class lubricant and the loss in using a poor one, yet for reasons of his own he will continue to purchase the inferior grades at a low price, let it be poured onto the journals and wasted like water, while the machinery wears out ten times as fast as it would if properly cared for. The owner or the directors of an establishment in many cases are not aware of the extent of injury done to their property and profits, and sometimes when they do know this it is a difficult matter to counteract the proceedings.

The friction of moving surfaces in contact includes three elements: First, the power used to overcome the friction; second, the wear on the surfaces, or in other words, the deterioration of the machine; third, the cost of the lubricant is the first cost per gallon, and the amount used for the lubrication of the surfaces and the amount needlessly wasted. The element of power used to overcome the friction of surfaces moving in contact is in common practice immensely variable. That is, in a great many places where poor oil is used and an imperfect system of lubrication is had, the portion of the total power absorbed by the piece of machinery which is used up simply to overcome the friction in its parts is as high as 20 per cent. and it may be more. The same piece of machinery with the best lubrication might be run with a friction power of not more than 2 or 3 per cent. of that required to do the work which the machine turns out. Another point on which power is lost is that when a piece of machinery has become worn in its moving parts through improper lubrication it runs under its work at a very great disadvantage and requires usually much more power to operate it than it would when all of its parts were held in line and in proper position with free and easy working fits. When a machine is so worn that there is radial motion in every journal, lateral play in the sliding surfaces and the bearings have excessive end play, the resulting vibrations in all parts of the machine are such as to absorb a large amount of power. This amount of power used is a great many times far in excess of what would be expected, and an actual measurement of it is surprising. Then again, the finished product turned out by a machine which is in such a condition is inferior to that from a machine which is perfect and in good working order, so that often the articles must be sold at a reduction or else there is danger of losing trade by imposing it on the market. Again, it is not very often that the amount of work or of finished product can be turned out by such a piece of machinery as can be done by a machine in good order. Thus it can be seen that there are three points of loss, the excessive amount of power used, inferior quality of the work done by the machine, and the reduced amount of product turned out—all caused by the excessive wearing out of the machine.

Next comes the element of deterioration. This is simply the wear which has occurred in the moving parts because of imperfect lubrication. Of course there may be such a thing as deterioration because of bolts working loose, parts keyed or fitted together in various ways becoming loosened and imperfect. Ordinarily in a piece of stationary mill machinery, if it is properly formed and put together, there will be no deterioration except that of wear in the surfaces moving in contact. If a machine is superseded after ten or twenty years by an improvement it might be asserted that this should be figured as deterioration in the old machine, and so it might be in one sense of the word; yet this would have no connection with deterioration in a piece of machinery as I have outlined it. The only way to restrict the deterioration of a machine under ordinary conditions is therefore to keep up as nearly perfect lubrication of its parts as is possible, thus reducing the power required to run the machine, reducing its wear and tear and keeping its production up to a proper standard both as to amount and also as to quality.

Its cost should have no consideration in the selection of a lubricant, that is to say, under normal conditions. For instance, if a good oil can be had at 80 cents a gallon and a poor one at 30 cents, the 50 cents difference between the two should have no weight in the selection of the 30 cent oil, because the saving of every 50 cents will in the long run cause an expense or a loss of fifty times as much, by the deterioration of the machinery, the consequent losses, and the increase of friction power. As to the actual cost of the oil per year for a given place, it very often happens that where an inferior oil, bought at a low figure, is used the quantity expended is so much in excess of what would be required of a good quality, the total yearly cost of the poor lubricant is as much as that for the high grade would have been. So a great many times the amount of money spent per year is sufficient to buy the best oil, yet the lubrication is of the most imperfect nature at the same time.

The use of an excessive quantity of oil of poor quality on machinery cannot be avoided, because the only way that the surfaces can be kept anywhere near cool is by continually swashing the oil onto them; this not only wastes the oil, but makes an untidy appearance on floors and over the machinery, which in many lines of business is a serious thing. In selecting a proper oil for a given purpose the greatest care should be taken in trying it before a large quantity is purchased, and in places of any size where oil is used to a great extent an oil testing machine should be employed to determine correctly the quality.

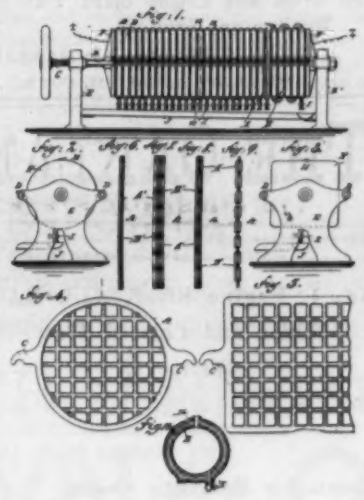
Electrolytic Apparatus.

An illustration is given of an improved apparatus for the electrolysis of solutions of all kinds, especially for treating solutions of chloride of sodium, chloride of potassium, of magnesium and other metals to obtain bleaching solutions, the apparatus being arranged for convenient attachment to any high or low tension current from any suitable source of supply.

Figure 1 is a side elevation of the apparatus; the right hand portion of the figure illustrating a slight modification. Fig. 2 is an end view. Fig. 3 is a like view of a modified form. Fig. 4 is an enlarged face view of an electrode. Fig. 5 is a like view of a modified form of the same; and Figs. 6, 7, 8 and 9 are transverse sections of modified forms of electrodes. Fig. 10 is a transverse vertical section of one of the frames taken on line 10—10 of Fig. 1.

The apparatus is provided with a series of electrodes, A, made in the shape of plates and arranged alternately with insulated frames, B, the latter, as well as the plates, being provided on opposite sides with lugs, C, resting on longitudinally extending insulated bars, D, supported in suitable standards, E and E', as shown in Figs. 1, 2 and 3. The electrodes are preferably made of a material which will not have any appreciable chemical action on the electrolyte, for instance carbon or platinum plates may be employed for this purpose. Such a material is termed "chemically indifferent." Any desired number of such alternating electrodes and insulating frames, A and B, may be arranged for an apparatus, and the electrode at one end is held against the face plate F', abutting against the standard E', while a like face plate, F, engages the electrode on the opposite end, and this face plate F is pressed on by a suitable screw, G, screwing in the standard E and serving to press the several electrodes and plates firmly one upon the other, as illustrated in Fig. 1.

The face plates F and F' are connected with the poles of the battery or other source of electric supply, and the frames B intervening between the electrodes are each provided on top with an inlet, H, connected with a suitable source of liquid supply, and each frame is also provided on its bottom with an outlet, I, discharging into a trough, J, supported on the standards E and E' and serving to carry off the liquid after it is treated. In practice the frames are provided with outlets to allow the air to escape when the liquid is poured in.



Electrolytic Apparatus.

It will be seen that by the alternately arranged electrodes and frames, special compartments are formed in each frame for the liquid to pass through, so that the electric current passes from one electrode through the liquid to the next following electrode, and so on, so that in each compartment the face of one electrode forms the anode and the opposite face of the other electrode the cathode.

It will be observed that the electrodes form partitions to separate adjacent cells or compartments, there being no direct communication between the compartments.

There is no conducting connection between the individual electrodes except through the liquid; that is to say, the electrodes are arranged in tension, instead of being arranged in quantity, as in the usual electrolytic apparatus.

The frames B are preferably made of iron covered by hard rubber, so that the metal is insulated, as in Fig. 10. The frames may also be made of clay, glass or celluloid or waterproof wood and other non-conducting material. The electrodes and frames may be round, as shown in Fig. 2, or square, as illustrated in Fig. 3, or of any other desired form, it being understood that the frames fit on the plates to form compartments for the passage of the liquid, as above described. Instead of passing the liquid through each compartment, the latter may be arranged so that the liquid flows in at an end compartment and through the several compartments at the other end of the apparatus. This modification is illustrated at the right hand end of Fig. 1.

Instead of arranging the electrodes and frames one alongside the other, as illustrated, they may be arranged one on top of the other. Instead of using separate frames and electrodes each electrode may be secured within a frame, so that by placing several electrodes alongside each other the frames of adjacent electrodes will be brought in contact with one another to form cells or compartments for the reception of the liquid. Figs. 6 to 9 represent in vertical section several forms of such electrodes combined with their insulating frames.

The electrodes are not continuous, but consist of numerous separate plates fastened to the frame like the panes of a window. In the drawings the frame is lettered B' and the electrode plates A'. It will be seen that there is no electrical connection between the individual plates A', and that the opposite surfaces of the plates will be in contact with the liquid in different compartments. As shown in Fig. 9 the plates A' may be provided with circumferential grooves adapted to engage with the frame B'. It will be seen that by this arrangement the electricity passes through the liquid in the several compartments with the same force, so that the liquid is acted on equally in each and every compartment of the apparatus.

The employment of chemically indifferent electrodes is particularly advantageous, as it will prevent secondary reactions, which are detrimental to the main electrolytic process. It will further be seen that any desired number of such arranged electrodes and frames may be arranged alongside each other, and connected with one and the same current which passes through all the apparatus. Thus, it will be seen that very high tension currents may be utilized, especially such as for electric lighting purposes.

Hangers.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By Sanford E. Thompson.

(Concluded.)

Self-oiling hangers are used very widely. The most common style of these is the wick feed, where cotton wicking runs through holes in the lower half of the lining of the box down into an oil chamber beneath. In the ring feed and chain feed boxes a ring or a chain takes the place of the wick. The ring is somewhat larger than the shaft and encircles it, the upper half resting upon the shaft, and the lower half running down through holes in the lower shell of the lining into the oil chamber. The rotation of the shaft keeps it in motion, and it is thus continually bringing up oil from the reservoir and feeding it upon the top of the shaft. Some object to the self-oiling hangers, saying that they do not require frequent attention, and are therefore liable to get out of order, but in a well regulated mill, where the oiler is required to make regular rounds of all the shafting, this objection has little weight. The oil reservoirs beneath the bearings should be carefully cleaned when erecting the hangers, and no dirt or grit should be allowed to get into them afterward. Hard grease should never be put into a self-oiling box. The box may be warm enough to melt it, but it will harden in the reservoir and is liable to stop the chain or ring from working.

The lining of boxes should on general principles be made of a material somewhat softer than the shaft, so that if the box should heat, or if anything should get into it, the lining will melt or cut before the shaft is injured. Babbitt metal is the lining most used, and for line shafting at high speed, doing heavy work, there is probably nothing equal to it. For light work and where the speed is not too high, cast iron makes a good lining. A cast iron box may sometimes heat slightly when the shafting is first started, but if it is once cooled down without the use of water it ought to give no further trouble. The linings of bearings having much strain upon them should be grooved so that the oil will be well distributed over the entire surface. In grooving, care should be taken that the grooves do not run clear to the end of the lining, for if they do the oil will run out. A great deal of oil is wasted by a careless oiler. In most mills it is sufficient to make the rounds of the line shafting twice a day, or, if the mill runs at night as well as by day, three or four times in the twenty-four hours. Of course the bearings of fan pumps and many of the machines must be attended to oftener than this, and in a new mill all bearings must be closely watched. Very little oil should be put on at each visit, and the oiler should be required to wipe off with waste any oil which may run over. It is very important that the oiler should feel of every box when he oils it to see that it is not getting warm. Sight feed oil cups are a good safeguard on important boxes even where the latter are self-oiling. If wick oil cups are anywhere used, care should be taken to see that the wick is taking up the oil properly.

Whenever a new belt is put on, the boxes nearest to both pulleys should be carefully watched when first starting up, for if the belt is drawn quite tight the box is liable to heat and may burn out in a very short time. To cool down a hot box it is often necessary to put on water or ice. Cylinder oil will sometimes be very effective, and this as well as ordinary machine oil may be used with hard grease, blacklead or sulphur. Water should never be put upon a cast iron box. It will cool it down, but will not keep it from cutting; in fact, if water is once put upon a cast iron box, it is almost impossible to run it afterward without water, and the lining will gradually wear away. If a box heats up on account of a tight belt, or from some other cause which cannot be easily remedied, it is a good plan to station a man at that box for perhaps a day or two, and to let him watch it constantly, putting on plenty of oil or other lubricant. If a mill is to be kept neat, drip pans under the bearings are essential. Sometimes cast iron pans are provided with the hangers. Where the hangers are located directly over a machine, or in a position where a few drops of oil will cause trouble, galvanized iron pans may be made of a size and shape to fit the hanger for which they are intended. These should be specially designed for each style of hanger and should be put on so that they will be firm and will not jar or rattle when the shaft is running. Bearings on some of the machines should also be provided with drip pans. The bearings of a Jordan engine require a great deal of grease and oil, which is liable to get onto the belt. This may be prevented by having a drip pan made to fit under the bearing and carry the oil away from the pulley. The ordinary tinsmith will make any of these drip pans if they are carefully described to him, and he can readily put a screw cap similar to the cap used on the top of a kerosene oil can in the bottom of them. By means of this the oil can be emptied without disturbing the pan.

Let us now turn for a moment to the spacing of the hangers. As has been stated, the distance apart should vary with the power which the shaft is to transmit, and also with the speed of the shaft. When a shaft is used for transmission only, 12 to 14 feet is not an excessive span for bearings supporting shafting of 3 inches diameter and over, even when running at a speed as high as three hundred revolutions per minute. Where pulleys are distributed along the line, 8 feet is a good span for general work. For short countershafts the bearings should be somewhat nearer together than this. Wherever there are heavy pulleys, it is well to put in extra hangers, so that at least one bearing will come close to a pulley.

Mistakes may often be avoided and much trouble saved by carefully specifying just what is wanted when ordering hangers. The exact size of the shaft to sixteenths of an inch should be stated and the drop of the hammer, that is, the distance from the centre of the shaft to the base. If it is desired that the hangers shall be double braced and the boxes adjustable, and ball and socket, these things should also be specified in the order; also whether ordinary or self-oiling boxes are desired. The speed of the shaft should be given, so that the manufacturer may know about what horse power is to be transmitted. Some

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manufacturers make the frame for a double braced hanger in a single casting, so that when putting up the shaft has to be run on end through the hanger. This is also true of some patterns of post hangers. If it is desired that the hanger should be "open end" it should be stated.

When a line of shafting is to be put up, it is of great advantage to prepare the supports and get everything ready to receive the hangers before they arrive. Many of the shafting catalogues now give full dimensions of the hangers, including the dimensions of the base and the location of the bolt holes. When these measurements are known the holes may be bored in the bridge trees and the hanger bolts cut, and then when the shafting arrives it can be put up without delay.

Correspondence.

MIAMI VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

DAYTON, Ohio, October 11, 1894.

Business conditions remain much the same as reported last week. The trade, while maintaining an encouraging gait, is not what it was expected to be, considering the flattering start a few weeks ago. However, paper manufacturers have been probably as fortunate as many business men in other branches of trade and they have attended other funerals besides their own during the depression.

The outlook grows brighter daily and little grumbling is indulged in. The chronic kicker is no longer spreading discontent and discouragement among his brethren. He possibly views a vista of prosperity.

One of the sturdy paper mill machinery establishments in the valley is that of the Black & Clawson Company, of Hamilton. This firm has kept apace with the advance of the manufacturing arts and at present stands in the first rank of its kind in the whole world. Recently it filled some extensive orders and at present has on its books a number of important ones. The company lately shipped to Moyer & Pratt, Greig, N. Y., fifteen seamless dryers, 36x54 inches, with frame, &c., complete; also two 14x58 inch rubber couch rolls with adjustable stands; to the Chelsea Paper Manufacturing Company, Norwich, Conn., twelve seamless dryers, 36x76 inches, with frames complete; to J. Mashima, Osaka, Japan, two chilled rolls, 14x68 inches and four chilled rolls, 12x68 inches; to E. C. Hargrove & Co., Hinckley, N. Y., four wet machines and thirteen fan pumps.

Thomas Boyd, trustee of the Louis Snyder's Sons Company, has filed a petition asking authority to cancel the lease of two rooms on Fourth street, in Cincinnati, which had been hired for a number of years at a rental of $425 per month. He explains that there is no use for the premises, the stock of goods having been sold. The rooms were leased from Lauretta B. Gibson, who claims the right to hold the company as a tenant, but is willing to compromise and relieve the firm for $1,165. The trustee recommends that the same be paid and requests permission to do so.

Parties taking a prominent interest in the proposed ship canal have held several meetings this week concerning the best method to show to the Government Canal Commission the superior practicability of the Miami and Erie route. Capt. W. E. Morris and R. Vinnedye called upon Congressman Sorg the other day and laid facts, figures and statistics before him for official use. Captain Morris' estimate of expenses and many other facts relative to this route have been given in full in this paper. It should be recalled that the Miami and Erie route is possessed of three important features which will receive favorable consideration, viz., sufficient water, a feeder of commerce to supply the carrying trade and an outlet to discharge the same at the termini. Mr. Morris' estimate, it will be remembered, placed the cost at about $10,000,000, and so strongly is he convinced of the peerless advantages of this route that an effort will be made to have him placed upon the canal commission so that he may properly impress the engineering corps with the correctness of his statistics.

The Cleveland route is said to be very long, with insufficient water upon the summits or watersheds to feed the canal, while the route from Erie to Pittsburg would involve a mammoth cost, as the head waters of the Ohio and Monongahela must be made navigable. The benefit derived from this route would rest in Pittsburg, as that city would in consequence receive vast quantities of Lake Superior iron ore.

Joseph Lanehart, an employee of the Wardlow-Thomas Paper Company, at Middletown, met with a serious accident this week which came near ending his earthly career. Lanehart was hoisting a bale of rags weighing 800 pounds, assisted by several other workmen, and when the bale was at a considerable height the chain snapped and the bale fell upon the side of Lanehart's head. He was knocked unconscious, but a physician reports that he will recover. Had the heavy object struck him squarely on the head, death would most certainly have resulted.

Morris Nixon, of the Thos. Nixon Paper Company, of Richmond, Ind., is now connected with the Foss, Schneider Brewing Company, of Cincinnati. Mr. Nixon is the general agent of the company, establishing agencies in various parts of the country. This is his exclusive work, barring the hotel trade. He handles only bottled goods. Morris is popular among trade men of the State and will no doubt cultivate a valuable acquaintance among hotel proprietors and managers. The paper trade is sorry to lose him, recognizing in him one of the most zealous workers and best posted men on the road.

Brandon Millikin, who has charge of Charles F. Gunckel's affairs, has been notified that his appraisement of the latter's real estate at $200,000 was a little too high considering the decline in prices and depressed values. He was advised to reappraise the estate, as bidders and buyers would most likely be more numerous.

Isaac Bennett, employed at the Novelty Works in Middletown, while attending to some repairs about an engine the other day, was fearfully scalded about the face, neck and arms by escaping steam. He was repairing the binding over the cylinder when the packing in the head blew out.

The Southern section of Ohio is noted for its many creditable county fairs. In the paper making section possibly the most noteworthy were the Franklin and Hamilton fairs. The latter is known all over the world as the "greatest on earth," a crowd of 30,000 being an average attendance. Nearly all of Hamilton's industries were there represented by valuable exhibits, and it may be said that the paper industry was about the only one slighted. Paper, not being an article of common use in the way of many others, was not exhibited in any form. However, paper manufacturers were interested in both directories of the fair associations. Members of the trade were deeply interested in the races.

During the past week several weddings in paper trade and social circles have marked the beginning of October. That of Harry Clegg to Lolo Crume, daughter of W. E. Crume, of the Crume & Sefton Paper Novelty Company, was notable.

A new company known as the Hamilton Canal Boat Company was organized the other day in Cincinnati. J. C. Richardson, the well-known paper manufacturer, was elected president; C. T. Hayman vice-president, and John W. Clements secretary and treasurer. Capital stock, $35,000.

The trade were startled this week when the announcement—quietly and reluctantly—was made that the Sabine-Robbins Paper Company, of Middletown, had been robbed of between $2,000 and $3,000. The defalcation is attributed to a former bookkeeper, W. H. Thompson, heretofore bearing a good reputation. The allegations are that Thompson was a little too gay and found the need of more spending money. It is possible that a settlement will be effected. Thompson is a Tennesseean and came to this valley two years ago well recommended. J. P. Anker, a former member of the firm and an expert accountant, discovered the shortage. M. V.

FOX RIVER VALLEY.

[FROM OUR REGULAR CORRESPONDENT.]

APPLETON, Wis., October 9, 1894.

The fortunes of the English syndicate continue to be the main topic of interest in paper mill circles in this district. It is said that a new phase of the subject has arisen and is engaging the attention of the promoter, Frank Butterworth. It is proper to state here that what is said of this new matter does not come from Mr. Butterworth himself, but from the best authority elsewhere, which, together with its natural probability, makes it worthy of much credit.

It is said that after Mr. Butterworth had secured all of the options he desired upon the paper mills he found that there was another matter requiring his attention, of which he had not thought at first. It was nothing less than the water power upon which the mills were situated. It became evident to him that it was of the utmost importance to secure control of this power for the syndicate, else, if the deal went through, the new owners might be severely handicapped by being compelled to depend for their power upon negotiations with the local proprietors of the water rights. It is plain that this is a factor of great moment, and the story goes that Mr. Butterworth immediately set himself at work upon the new complication. A conversation had by your correspondent last evening with Mr. Butterworth gives color to this supposition. The gentleman stated that he had completed his work of securing options upon the mills, but said that he should not leave at once for England—as it had been understood that he would—as other matters needed his attention. He said that he did not know when he should be able to get away, but would do so at the earliest possible moment.

In securing the water power the principal owner with whom Mr. Butterworth will have to deal is the Green Bay & Mississippi Canal Company, whose offices are in this city. A controlling interest in the stock of this corporation is held by J. S. and W. M. Van Nortwick, who are so well known as paper manufacturers in this valley. These gentlemen were in Chicago last week for several days, and Mr. Butterworth was also in that city contemporaneously, which may or may not be significant. The water privileges of this company were confirmed to the company about two years ago by the United States Supreme Court, and are very valuable, as under the terms of the decision it is entitled to all of the surplus water in the river not used for navigation purposes. It can be understood therefore that if the syndicate gets possession of these rights it will have to add a considerable sum of money to what it has expected to pay for the mills.

A mysterious fire occurred at about midnight last Friday night in the pulp mill of the Van Nortwick Brothers in this city. The mill has been shut down for several weeks, as the power was leased to the Kimberly & Clark Company, and it is difficult to see how the fire could have originated, unless the building was occupied by tramps. When discovered the fire was in the wet-machine room and by hard work the firemen prevented it from spreading to the other rooms, although the machine room was completely gutted. The two wet machines were destroyed, together with other machinery. The loss is estimated at from $2,500 to $3,000, and is covered by insurance.

The plant of the Manufacturing Investment Company was shut down last Sunday for the day in order to allow some repairs to be made in the water power arrangements. Work has just begun upon the construction of a new navigation lock immediately below the mill of this company. The work is being done by the Government, the War Department having charge of the navigation on this river.

John Strange, the well-known paper manufacturer, of Menasha, has a plan which he thinks will be easily worked, in case the English syndicate scheme falls through and it is decided best to effect some sort of

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a combination, provided the right man takes hold of the matter. He says that it would be perfectly feasible to organize all of the paper mills into one company, capitalized at say 10 per cent. more than their actual cost, and to have all the stock subscribed for by the younger men in the business, and then bond the properties at from 5 to 7 per cent. for the requisite capital. Paper mill stock has such a fine value as a security that it would be easy to dispose of all the bonds at par, and with the concentration of the business it would be easy to earn profits to pay the interest and each year largely increase the sinking fund, so that in a few years the bonds could all be paid and the company would be free of all incumbrance.

The interurban electric railway scheme between Oshkosh and De Pere, touching all the Fox River cities, which was thought to have been killed in the Appleton council, as reported in these columns, is being resuscitated and bids fair to prove a very lively corpse. A big mass meeting of the citizens is to be held to-night to endeavor to secure a reconsideration and passage of the original ordinance. The proposed railway would be a valuable thing for this district.

The pulp wood season at the docks at Long Tail Point is now closed, and no more wood will be brought in with the exception of one boat load of about 300 cords. Contractor Frank Perry of the "Soo" was in town last week and attended to the closing up of the wood receiving business in a proper manner. With the close of the shipping season the cutting season in the northern woods begins. Reports received from the pulp wood districts are to the effect that the weather has been quite unfavorable on account of too much rain, which has filled the marshes with water. Wages in the woods are the same as last year, from $16 to $26 per month, the latter figure being for the very best experienced men, and there are plenty at these prices.

Ground wood pulp continues high in price and difficult to get at any figure, on account of the low stage of water. A tugboat which was bringing a scow loaded with pulp wood up the river the other day struck a snag near Kaukauna and filled and sank. It has since been raised.

Reports from the new town of Nekoosa on the Wisconsin River are to the effect that new houses and business buildings are springing up on every hand and that the town is experiencing a veritable boom. The World's Fair paper machine at the company's mill was started up about two weeks ago and is turning out a very fine sheet of paper, and it is expected that the other machine will be in operation in about a week. Aug. Pohman, one of the employees of the company, lost a portion of one of his thumbs in a barker last week.

The roofs of the mills of the Thilmany Pulp and Paper Company and the Kaukauna Paper Company were treated to coats of black paint last week which considerably improves their appearance.

Jas. J. Lowden, of Boston, took his departure last night for the East at the conclusion of his work here for the present. He has secured the contract for supplying all the boilers at the Kaukauna Paper Company's mill with his patent feed water regulators. He also has other contracts in hand which will doubtless be heard from before very long.

The local paper makers are arranging a benefit ball to be held in this city next Saturday in aid of Major Moore, who was seriously injured last spring in one of the Wisconsin River paper mills.

W. C. Brokaw, of Three Oaks, Mich., is the guest of his son, N. H. Brokaw, of Kaukauna.

C. H. Kendrick, of Chicago, was in town last week looking over the paper mills.

C. S. Boyd, of Appleton, is now engaged as traveling salesman for the Moser-Burgess Paper Company, of Chicago.

C. W. Herrick, of New York, called on friends in the paper trade in this city last week.

FOX RIVER.

HOLYOKE.

[FROM OUR REGULAR CORRESPONDENT.]

HOLYOKE, Mass., October 11, 1894.

Nothing of special importance has transpired this week to disturb the monotony which has reigned here for some time. The mills since starting up after the shutdown because of low water have managed to keep along without further delay. The supply of water has not increased materially this week and steam has been used by a number of mills.

Speaking of low water reminds me that while conversing with an official of the Holyoke Water Power Company one day this week he informed me that the minimum flow of water in the river during the past summer has been only 50 per cent. The company has no record which will equal this. The river bottom has been in sight for months, and a person can cross from side to side below the dam dry-shod.

As regards business, it will not require much space to tell the story. The mills are all running, some in part and others full, but the situation is far from satisfactory. Some of the manufacturers have made money this fall, but nothing to brag about. Several mills are pretty well supplied with orders, and are running full, but these orders have been taken on a small margin.

The stock market is rather quiet, and it is easily accounted for. The manufacturers are not buying beyond actual needs, and drummers find it a difficult matter to tempt them from their policy. The call for foreign rags of good grades is limited to immediate needs, and domestics are, on the whole, rather quiet. Prices remain about the same as they were several weeks ago.

The Horner Machine Company, of this city, recently filed an attachment for $5,000 against the Powers Paper Company, also of this city, to cover a claim against the latter company for machinery and general repairs on the plant. The attachment was soon dissolved, H. S. Hyde, of Springfield, and George C. Gill, of this city, becoming bondsmen for the Powers Paper Company. The matter will probably soon be settled.

The Central Labor Union recently succeeded in getting an order through the city government to the effect that all city printing must hereafter bear the label of the Holyoke Typographical Union, and a part of the city work has already gone to the Griffith, Axtell and Cady Printing Company. This is a direct slap at the *Transcript* Publishing Company, which has always done most of the city printing. The strike in that office has never been settled.

When the strike occurred in the *Transcript* office last summer the circulation of that newspaper was over 5,000. It fell off very rapidly after the strike was inaugurated, and at one time it was less than 2,500. Editor Dwight told me this morning that the circulation of his paper has now reached 4,800. The trouble, however, has been very ruinous both to employer and employees, and is to be regretted.

The George C. Gill Paper Company is said to be doing a successful business just now. Mr. Gill is a lively business man, and he understands how to get orders.

Maggie H. Lawrence, an employee of the Whiting No. 1 finishing room, died very suddenly at the mill on Tuesday afternoon. She was apparently enjoying good health, but the cause of her sudden death was due to apoplexy. Mrs. Lawrence was about fifty years of age, and had been employed by the Whiting Paper Company for about twelve years. The body was taken to Newburg, N. Y., for interment.

The wedding of George S. Parsons, of the Parsons Paper Company, and Mary Louise Shumway took place at the Second Congregational Church on Wednesday evening, and was a swell event. Many city people and visitors from the West were present.

We had an all day rain yesterday—the first in many months—and it is to be hoped that the dry spell is now broken.

H.

BOSTON.

[FROM OUR REGULAR CORRESPONDENT.]

EASTERN OFFICE PAPER TRADE JOURNAL,
67 FEDERAL STREET,
BOSTON, October 11, 1894.

Reports of city paper dealers continue to be favorable as to the movement of paper.

Some firms say that they are very busy, while other dealers report that orders are not coming to hand as regularly as they ought. Yet viewing trade as a whole, present business is very good with local firms, compared with that of some two or three months ago.

The announcement of two failures this week, one in New York and the other in Cambridge, a suburban city of Boston, has tended to unsettle confidence a little. The failure of the New York paper house is felt here to some extent, but how many of the city firms are creditors is not yet made public.

The failure of the University Press of Cambridge was quite a surprise to the city trade, as this concern has had the reputation of doing a large and profitable business. In explanation of the failure, it is said to be due not to business losses of the firm but to the indorsement of accommodation notes with the firm's name by Charles E. Wentworth, the financial manager of the University Press. It is stated that this was done without the knowledge of Mr. Wilson, his partner, who is a man well advanced in years and feels very keenly the blow which has caused the suspension. Leaving this paper out of account, the firm has a large margin of assets over liabilities, and in fact has been a prosperous concern. During the present depression it has made a satisfactory profit. The indorsement was largely for N. Wilson & Co., bookbinders, 112 Beach street, this city, and amounts to about $65,000, but was at one time much larger. The manager of the house of N. Wilson & Co., is one W. J. Wilson, who failed a few years ago with heavy liabilities.

No statement of assets and liabilities has yet been made. Several of the leading paper manufacturers of the city are among the creditors.

During the present week rains have been frequent, and at times the storm has been very severe and quite extended, so that the water supply throughout New England must have been largely increased.

With plenty of water, thanks to the storms, stock importers are feeling a little more cheerful, as they are anticipating a better demand for paper stock with the mills running full again. Conditions governing the paper stock market have been so unfavorable for so long a time that prices are ruling very low, and because of those conditions imports have been very light. Whether or not the demand will remove stocks in store before the close of the year is an open question.

The New England Paper Box Manufacturers' Association enjoyed its quarterly banquet at the Revere House last evening, having as special guests L. G. Burnham, president of the Associated Board of Trade of Boston; John Shepard, of Shepard, Norwell & Co., and Col. H. A. Thomas, the Governor's secretary. Others who occupied seats at the "round table" were the president of the association, George H. Dickerman; the secretary, H. B. Chaffee and Walter S. Barnes, C. F. Simes, Edwin F. Fobes, Joseph L. Bicknell and Charles W. Jencks.

An excellent menu was partaken of, and then President Dickerman spoke a word of welcome, saying that he was glad to see all in a more cheerful mood than when they last met, on account of the better business of to-day and the promise of even better in the future.

"Since the panic began, in July, 1893," he said, "we have not reduced the wages of our employees one cent. If we wish to have the good will of our help and of all who know us, with peace of mind and prosperity in business, we must pay liberal wages. It insures the most capable and reliable help, who will be interested and contented, and will produce the best work in the shortest time. Take an interest in the welfare of your employees, be charitable to those in need, encourage the deserving and see that they are well paid."

The Boston Paper Trade Association will hold its first meeting of the season on the evening of November 7, the first Wednesday of the month, at the Exchange Club, the new downtown club, where the business men mostly congregate for lunch every day. Out of town members are advised to make a note of the date of this meeting, as the executive committee is anxious that they shall shape their visits so as to be in Boston that day.

Joseph H. McCormick, representing the International Pulp Company, New York, was in town this week, his first visit to Boston for six months or more.

Other recent trade visitors were William Whiting and C. A. Crocker, of Holyoke; Campbell Chapin, of Mittineaque, Mass.; Wellington Smith, of Lee, Mass.; Mr. Williams, of Worcester, Mass.; Charles S. Mayo and J. R. Bailey, of Lawrence, Mass.; Joseph Philbrick, of North Dighton, Mass.; Frank P. Carpenter, of Manchester, N. H.; C. E. Robertson, of Bellows Falls, Vt.; Charles R. Milliken, of Portland, Me.; R. W. Sawyer, of Bangor, Me.; J. W. Chalmers, of Camden, N. J.; C. L. Waterbury, of Oriskany, N. Y.; George W. Fletcher and Allan Fletcher, of Detroit, Mich.; Archie Christie, W. R. Sheffield, I. R. Elston, Henry Atterbury and C. A. Whedon, of New York.

That trip to Portland, Me., last Friday, the dinner at the Cumberland Club that same evening, and the clambake at Pine Point the next day were heartily enjoyed by the several gentlemen guests of Charles R. Milliken, upon whose invitation the party journeyed from this city.

The ride over the Boston and Maine Railroad was very pleasant and the excursionists were in good humor, forgetting the cares of trade and giving themselves up entirely to the pleasures of the occasion.

Arriving at Portland the party was met at the depot by Mr. Milliken, who extended welcome to his guests, and with him were several members of the Cumberland Club, including the Hon. Thomas B. Reed, who took Col. A. G. Paine under his personal charge.

The party of visitors included Col. A. G. Paine and James Tanner, of New York; Col. Hugh Cochrane, Col. S. P. Train, Charles D. Brown and Harry T. Bartow, Adna T. Denison and A. L. Delesdernier, all of Boston.

After an hour's rest at the Falmouth House the excursionists wended their way to the Cumberland Club, where they were received by the following named members of the club: Hon. T. B. Reed, Hon. F. A. Wilson, Hon. Chas. F. Libby, W. F. Milliken, S. T. Pullen, Frank C. Crocker, Lewis Pierce, John C. Small, Robert Williams, W. H. Anderson, H. H. Furbish, George Duncan, Edward Woodman, Captain Rogers, Samuel Rogers, George Burnham, Charles Morrill, Charles Cushing, Dudley Lunt, Horace Anderson, Ira Crocker and Ruel S. Maxcy.

Each member's locker was thrown wide open to the gentlemen from New York and Boston and the freedom of the club was extended to them, from the little anteroom off the hall to the private rooms on the floors above.

At the banquet table Hon. T. B. Reed presided, and what a dinner Mr. Milliken had prepared for his hungry guests! Everybody did full justice to the menu and for a couple of hours the dining hall was merry with the evidences of good cheer, but as "there are moments when one wants to be alone," about midnight the guests sought their resting places to refresh themselves with sleep, for a clambake was on the programme for the morrow.

About 1 P. M. of the following day—Saturday—Mr. Milliken's guests from New York and Boston and the members of the Cumberland Club took the train for Pine Point, a few miles distant from Portland, the scene of the clambake.

Everything was ready when the party arrived, and the guests were ready likewise. The long board tables, set in a clearing on the bank under the tall pine trees, were soon surrounded, and the steaming clams and red hot lobsters, green corn and eggs, right from the bake, were so inviting that everybody went right in without formality or ceremony, and kept at it until the inner man rebelled against further stuffing.

Some three hours were spent in the pine woods and it was really remarkable to see how thoroughly every man did enjoy himself. For the time being Mr. Reed forgot all about the political situation; Colonel Paine gave no thought to his varied New

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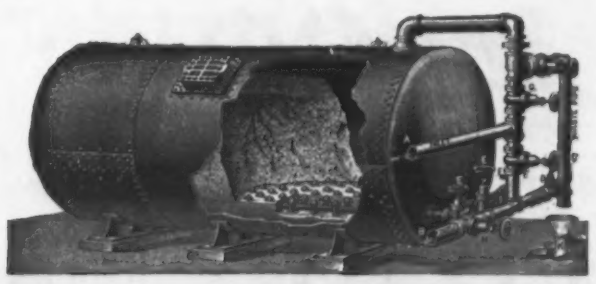

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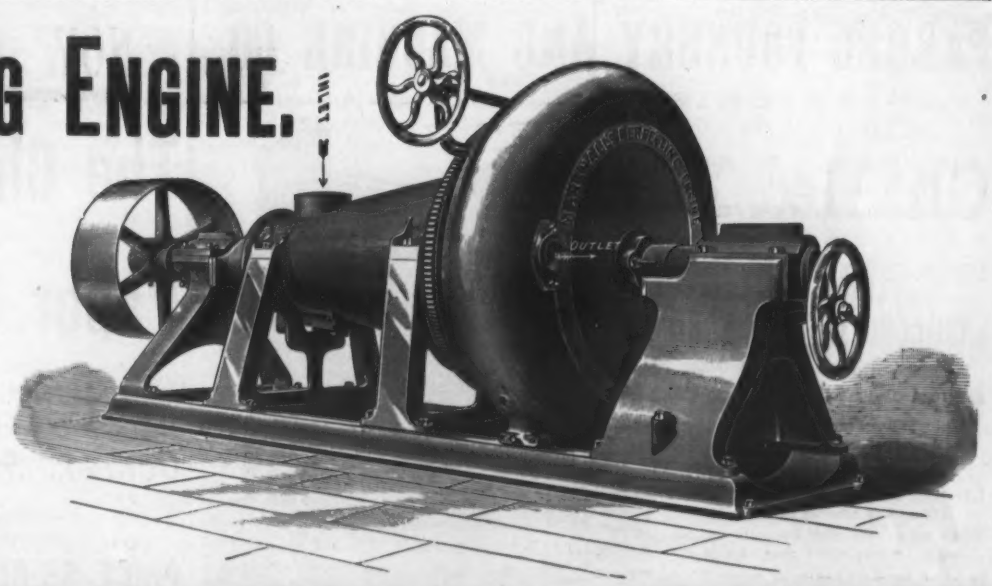

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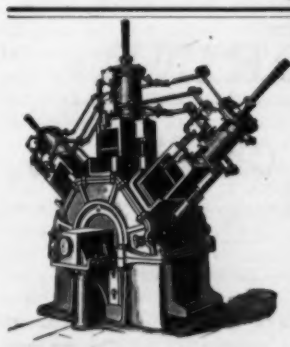

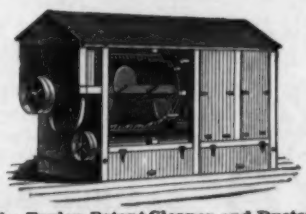

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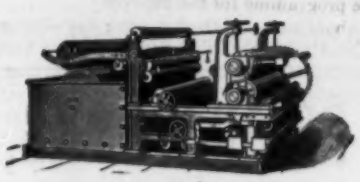

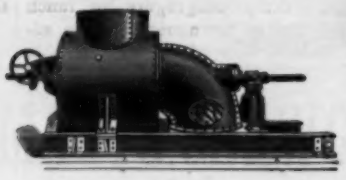

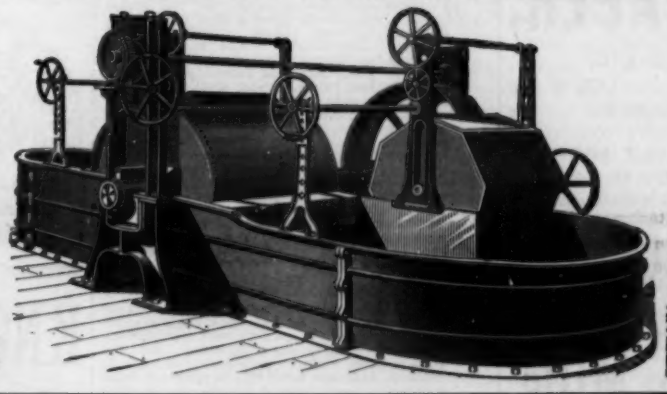

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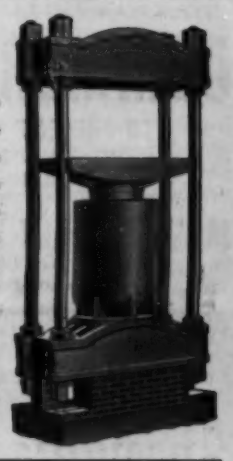

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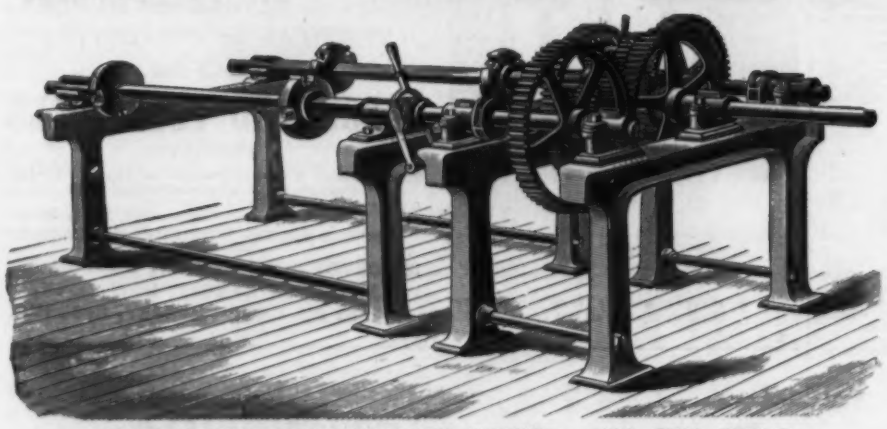

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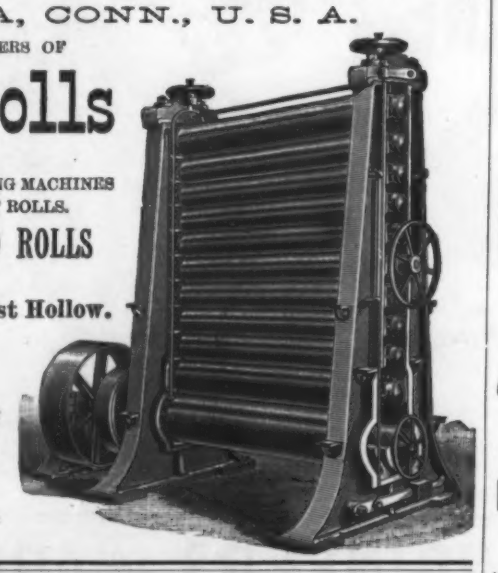

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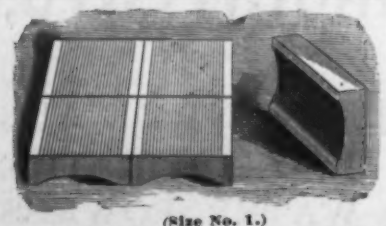

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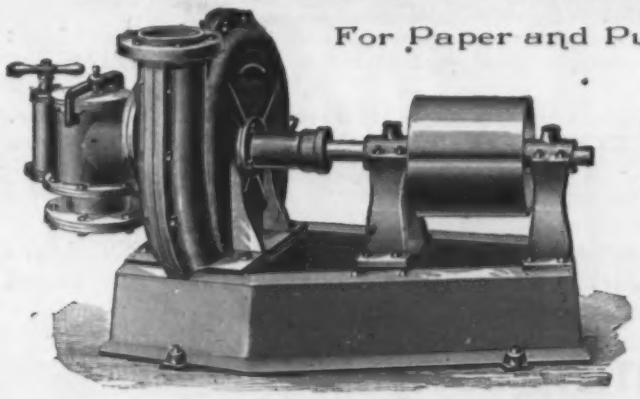

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CHAPTER II.—**Fibres.** Cellulose in its relations to the plant; the vegetable cell; the cell wall; changes which occur in the cell wall; lignin or incrusting matter; its chemical properties; characteristic markings of the cell wall in different fibres; characteristic cells other than fibres in different pulps. Classification of fibres: 1. Seed hairs; cotton, chemical and physical character of fibre, dimensions, analyses. 2. Bast fibres, as linen, jute, hemp, manilla, rhea, ramie, agave, sisal, adansonia, &c.; occurrence in plant, separation of filaments; character, size, distinguishing features of filaments and ultimate fibres, analyses and chemical properties. 3. Fibres and other cells from whole stems and leaves, as straw, esparto, bamboo; measurements and characteristics of fibres, yields, analyses; characteristic cells found with fibres. 4. Wood fibres; growth of wood; cambium layer; spring and autumn wood; sap and heart wood; resins; bark and knots; analyses of woods; specific gravities; ash; fuel values; occurrence and character of all woods used for pulp making.

CHAPTER III.—**Processes for Isolating Cellulose.** Rag boiling; special treatments for various fibres, as jute, straw, esparto; review of miscellaneous processes for treating wood; the water process, aqua regia, &c.; the soda process, history; preparation of liquors, boiling, washing, recovery, sources of loss; analyses of chemicals and liquors; the sulphite process, history; general principles; the different systems; liquor apparatus; preparation and analyses of liquors; digesters; linings; boiling; subsequent treatment of pulp; waste liquors; recovery. The sulphide and sulphate processes.

CHAPTER IV.—**Bleaching.** General principles; bleaching agents; bleaching powder; deterioration; analyses; preparation of bleach liquors; use in chests, engines, drainers; hot bleaching; acid bleaching; use of alum; chlorination and oxidation of fibre; washing stock, antichlors; loss in bleaching; ozone bleach; hydrogen peroxide; permanganate; sulphurous acid; special processes for various fibres.

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CHAPTER VI.—**Coloring.** Mineral colors; vegetable and animal colors; aniline colors; chemical properties; effect of alum and traces of bleach or alkali in different colors; distinguishing tests; effect of different waters.

CHAPTER VII.—**Water and Water Supply.** Character and analyses of different waters; ground waters; surface waters; river water; artesian well water; hard and soft waters; boiler scale; effect of waters on size and colors; various systems of filtration; use of alum; softening water; self purification of streams; natural filtration; effect of storage; vegetation in ponds; crenothrix; consumption of bleach by waters.

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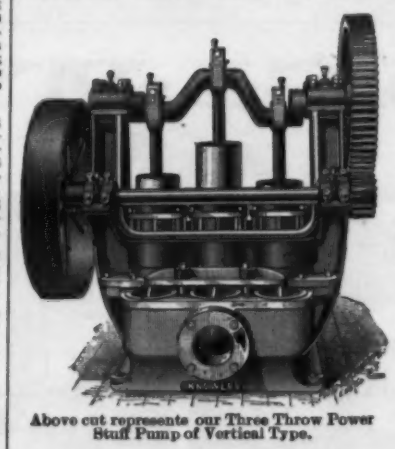

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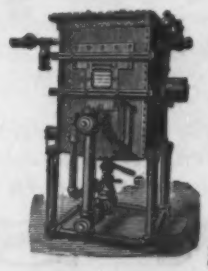

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York affairs; Colonel Train and Mr. Milliken cared little about rags, pulp or paper—they interested themselves in other matters; while others of the party joined with each other in making the occasion a regular holiday. School boys let loose at a picnic never enjoyed themselves as well as did the many staid men of business prominence who gathered at this clambake. The occasion was indeed most delightful, and a pleasant success in every particular.

It was nearly 10 o'clock that same Saturday night when the Boston excursionists alighted from the cars at the Union Depot in this city. What a comfort it was to think that the next day was Sunday—a day of rest! DELESDERNIER.

How Is Your Steam Boiler?

[WRITTEN FOR THE PAPER TRADE JOURNAL]

BY JAMES F. HOBART.

Third Paper.

(Continued.)

The next thing to be looked after is "burned plates." Now, it is a "well proved axiom," as the "geometry sharp" would say, that a plate used in the construction of a boiler can never become burned as long as water is kept on the side opposite the fire. This being well understood, it is correct practice to turn the "axiom" around and say that "plates will surely burn if exposed to the fire without water on one side of them." Then in the search for burned plates see if there is any chance whereby any part of the shell can be exposed to the fire while there is no water on them. This can be done in several ways, namely: The inside of the boiler may be covered with a thick scale, which prevents the transmission of heat from the fire to the water, fast enough to keep the boiler shell cool; also by a collection of mud or sediment on the bottom of the shell, which causes a local burning of the shell, and often allows the metal to get so hot that the pressure bulges out that part of the shell, forming a more or less pronounced "wash basin" over the furnace, on bridge wall. Another way of burning is by letting the front arch (over the fire door) get out of repair (perhaps it was wrongly constructed in the first place), so that the rivets which fasten the head to the shell are exposed to the fire. This can occur only when the front head is turned flange inward. When it is turned the other way the flange and rivets come inside, and can never burn, as they are at all times under water.

Another cause of burning is the overhead flue, or "triple return," as it is called. By this method the products of combustion are all carried over the top of the shell, and come in contact with the steam space part of the shell, and of course there is no water against it; hence the danger of burning. Usually the heat is so nearly all taken out of the flue gases before they get through the overhead return that they are colder than the steam, and thus cause a loss instead of a gain; but occasionally the conditions are such that the shell is burned by the intense heat in the return flue, and the iron or steel shell scales (inside and out) like a piece of iron in the blacksmith's fire.

There is one more cause which might cause a boiler shell to burn, but it is one which I have never come across. It is this: The plates may be so thick that the heat cannot be conducted through them fast enough to prevent burning. The engineers on the Mississippi River are great fellows to bring up this objection and they (or many of them) think that a shell cannot be made more than a quarter of an inch thick without danger of being thus burned. This is more of a bugbear than anything else. I have not yet seen a case of burning caused by too thick plates up to a thickness of three-quarters of an inch.

The usual cases of burning are: the "pocket" in the bottom of the shell over the fire, and the front end of the shell forming the "dry sheet." The best way to protect the latter has already been discussed, viz., bricking in the rivets. The "pocket" business can be looked out for by keeping the boiler free of mud, loose scale or other deposit at all times. There are handholes in every boiler head or shell, or there should be, and no man should buy or operate a boiler thus unprovided. If you have a boiler which does not carry a handhole in each head underneath the tubes, get a boilermaker to cut such holes at once, not only for the protection of your own life and property, but for the safety of your neighbors. Through these handholes the condition of the boiler can largely be determined, and through the front handhole of a horizontal tubular boiler a close watch must be kept for internal deposit, and then such deposit must be removed as soon as it collects.

The front handhole plate should be taken out frequently, especially in a boiler with which you are unacquainted, or one which collects a good deal of deposit. A candle or torch should be passed into the boiler through the handhole, made fast to the end of a long pole or to the tube cleaner rod. Push the light to the back end of the boiler and any bunch of sediment can easily be seen and as easily removed with a small scraper or hoe.

Several times I have been professionally called to see boilers where the fire sheet had "come down," forming oftentimes as pretty a "wash basin" as the tinman could make. In some of these cases, after the boiler was blown off and opened, not more than 3 or 4 quarts of sediment would be found, and that, too, would sometimes be so scattered that seemingly there was no connection between 4 quarts of mud and a bulge in the shell plates; but there is a conviction, and a strong one, too, and this is the way in which they are related: Let it be considered that there is some mud boiling around in the water. During hard firing the water keeps up a most vigorous circulation, taking heat from the hottest part of the boiler, and distributing it to other and cooler portions. Under such conditions the furnace door is opened to fire up or to stop the formation of steam, the pressure of which has become too high. Then cold air enters the furnace and strikes directly against the shell plates. The result is to instantly stop the circulation of the water—and mud too—and the latter falls to the coldest spot it can find, which now is that spot over the fire where the cold air impinges.

At last, the conditions being all right, the bunch of mud gathers so tightly that it is not dissipated again when circulation re-begins. There the bunch of mud sticks and bakes onto the shell, getting harder and harder until at last it keeps all of the water away from the portion of the shell which it covers. Then the "fun" begins. The sheet keeps getting hotter and hotter, for there is no water on the other side of the plate to carry away the heat as fast as it goes to the plates. After the shell gets pretty hot and loses much of its strength the internal pressure is sufficient to bulge the iron and form the "wash bowl," just as a boy blows a soap bubble. Usually the bulging of the plate breaks the scab of mud, allowing the water to again reach the plate, and the first few drops of water to get there are instantly blown into steam by coming against the red-hot metal, and the steam thus generated most effectively disperses and breaks up the mud deposit which caused the bulging business.

Blisters are caused almost exactly as bulges are made, with the difference that the water is kept away from the iron by sediment in one case and by a layer of iron in the other. A blister can be very prettily illustrated by putting two plates together and working them into a boiler shell. The outer plate gets hot from the fire having a chance to act directly on it. The inner sheet is kept cool by the water which conducts away the heat as fast as formed. Now the two sheets are fastened together, one being heated hotter than the other, and it expands. What is the result? The riveting holds the edges of both plates together, and as the extra metal *must* go somewhere, it expands into a bulge and takes up the excess of area in that manner.

Some blisters are harmless. They can be called so only when they are quite thin, and the metal under them is smooth, clean and sound. Such a blister, after being trimmed, may be considered as "harmless" when it is not more than one-fourth the depth of the plate in thickness. The reason for this is that such a blistered plate is as strong as the seams of the boiler, and as a double riveted seam has about 70 per cent. of the strength of the solid plate, it therefore will do no particular harm to remove a small strip of the plate to the extent of a quarter of its thickness.

If a sheet is blistered half way through it might be advisable to cut out the blistered part and put on a patch. This would be policy on a double riveted shell, but it might not be with a single riveted one, where the strength of seam is only 56 per cent. that of the solid shell. Then with even half the thickness removed the remainder, if sound, would be nearly if not quite as strong as the seam. Blisters have a tendency to crack in the middle of the bulged out part, and they should be closely watched. They form a fine pocket for sediment to collect in, and with some kinds of water a patch is necessary because it is impossible to keep the bulge clean, hence it will soon burn through.

Internal grooving is a disease which was more prevalent during years past than it is now. The reason is that there used to be only iron boilers, and iron is badly given to grooving. Now there are few other than steel boilers, and they do not groove as readily as the iron. Grooving is a corrosive action in a straight line along the edge of a seam. It is caused as follows:

Metals are very readily attacked by acids where they have been disturbed by bending, hammering, or otherwise distorting the fibres. Such a disturbance is often found along the edge of a lap, the iron or its fibres having been disturbed during the boiler making process. Water which has been in a steam boiler at work seems to have a particularly corrosive action, almost equal to an acid, and whenever it finds a place weakened as above stated it goes at once to work dissolving away the plate; hence the corrosion commonly called "grooving." The remedy is the same as for pitting, *i. e.*, keep the boiler charged with a harmless alkali like soda ash.

It is well to show the location of the boiler on a diagram, and it is of great value in determining whether or not the steam and water connections have been properly made. It also shows whether or not the boiler capacity is properly located in relation to the place where power is to be used. In case of accident such a plan is invaluable, and it is well for the owner to have made a more or less elaborate plan of the entire plant, showing the entire ground arrangement of buildings, machinery, steam, water pipes, &c.

Is the boiler room neat and in good order? I am afraid that this question has to be answered in the negative in many cases, and generally the answer may be taken as an indication of the condition of the boiler and engine too.

Note the distance of the boilers from the woodwork. This means from the nearest post, beam, wall, floor or partition, and may have a great effect some day in helping to adjust a loss with the fire insurance company.

Have you examined these boilers internally? This is a direct question, and if it cannot be answered "yes," then some other questions cannot be truthfully answered. There should be no slouch work in this kind of an examination.

Did you apply the hydraulic test? This should be answered "no" if the boiler is large enough to get inside of. If, however, it is too small or has no manhole, and the looking over has to be done through hand and plug holes, then it is well to pump them up with water.

Pressure at which the boilers were tested? Right here is where the hydraulic test is abused. Too much pressure is applied and the shell is unnecessarily strained. No more than one and a half times the working pressure should be used for revealing leaks, and that is all for which the hydrostatic pressure should ever be used. In extreme cases the greatest pressure which should ever be used in testing boilers is one-half of the calculated bursting pressure, and this pressure should never be applied just "for the fun of it."

Next comes classification. Class? This does not amount to much, except for a regular inspection office, and there everything first class is rated "Class A." Something not quite as it should be would be rated "B," or "C," but for the engineer who simply inspects his own boiler classification means nothing, because he does not have a large number of other boilers to compare his with.

The next thing is for the engineer to sign and date this data slip, and then it may be filed away for future reference, and by looking at it he can compare the condition of the boiler at any time with its condition when new or at the time of inspection in any previous year.

(To be continued.)

Old Mills and New Mills.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

BY JAMES HALL.

Second Paper.

How very often has the man whose lot it was to work the old mill, that was small, cramped up, dirty and inconvenient, wished that he could just have it in his power to build a new mill; to begin de novo, say in a field, and construct a mill after his own heart! The building of a new mill, however, is a matter requiring great thought and not a little experience if the best results are to be obtained.

In determining upon the erection of a new mill two or three important matters have to be kept prominently to the fore. (1) As to the site, (2) as to the kind of erection, and (3) as to the nature of the paper to be made; the first and second being largely governed by the third.

First, then, in the selection of a site for a mill there are again sundry matters of grave importance to be considered. The first and foremost of these appears to be that of choosing a locality which contains the greatest combination, so to speak, of "natural advantages;" a site which shall have advantages in the way of water power for driving, as well as a fruitful supply of the right kind of water for washing and bleaching purposes; that is, assuming that the mill is going to make a paper for which these are essential and necessary.

A second consideration should be that of choosing a site free from surroundings, already existing or likely to be called into being, which shall prove inimical to the making of clean paper.

The point of chief importance when selecting a site for a paper mill is that of choosing one in the highest degree favorably located as to railway accommodation. When it is borne in mind that a mill making, say, 50 tons of paper per week has to bring into the mill a quantity of material three or four times that amount in weight the question of transit is of no small importance. Even where the rates are reasonable the freight in and out totals up to a very large sum, and in many cases proves a great drawback to the successful operation of the mill.

Not only should an effort be made to locate on a spot where railway charges—to and fro—are fixed at a minimum of cost per ton of raw material or finished paper, but where there is competition in the conveyance of goods, so that when the mill is started, the owner may not have any sudden increase of freight sprung upon him. Money saved in this way is equal to a profit.

Other matters of less importance when choosing a site for a mill should not be lost sight of, such as the convenient housing of the help, a good commercial bank, a post office and telegraph station, &c.

The next thing is what kind of a building shall there be? In the first place the building should provide ample accommodation for the work to be done, large enough, but not too large for the machinery to be put in, for a mill too big is almost as bad as a mill too little; it makes it unwieldy, and difficult of control and management. At the same time the building should be so erected and the room space so arranged that when the time comes that the output requires to be doubled, additions can be made without destroying the uniformity of the original structure, or having to add a conglomeration of small buildings. Space should be reserved for adding a second machine by the erection of another machine room parallel with that already existing; and the same thing with respect to the preparation department and finishing room, and these enlargements should be made without stopping or interfering in any way with the working of the mill.

Next to providing the requisite space for carrying on the work in an efficient manner is the arrangement of the rooms and plant so as to secure (1) economy of labor, (2) efficient supervision, (3) cleanliness, (4) departmental isolation, and (5) immunity from heavy or exceptional insurance charges.

Those who have been through a large number of paper mills—old and new, small and large—will have seen for themselves the difference in the amount of help required to carry on the same amount of work, owing to the difference in the setting out of the mills, the arrangement of rooms, plant, &c. In some cases the arrangements are so bad that the stuff has to be conveyed from place to place, involving a vast amount of useless labor. The object, therefore, should be to work as closely as possible on what is called the "direct system." That is, to have the raw material go in at one end of the mill and come out finished paper at the other. There should be no turning back of the stuff, but a straight and undeviating course right through. This saves a vast amount of labor, which means money, besides keeping the stuff cleaner and more compact.

In a mill so arranged the matter of supervision is rendered much more easy and effective. The superintendent can see and be seen by everyone who may have business with him, and not be lost, as it were, half his time in traveling through a number of small rooms—here, there and everywhere.

Cleanliness has been adverted to in the previous article. Too much stress cannot be laid upon this essential feature, particularly in mills making good papers.

The last point to be carefully observed is the arrangement of the different departments of labor to avoid special and unnecessary insurance premiums. It has unfortunately always been the custom for insurance companies to look upon paper mills in a somewhat jealous and suspicious manner. They invariably regard them as a kind of "special risk." It is quite true that there are some parts of some paper mills which are vulnerable. It all depends on the kind of paper made and the stock used. For the most part, however, there is nothing particularly risky about a paper mill if things are properly arranged. In the washing and bleaching, as well as in some parts of the boiling department, you could not start a fire if you were ever so inclined to, and the same may almost be said of the machine room. By judicious isolation of all kinds of inflammable raw materials a great deal may be effected in bringing down the insurance premiums to a minimum, and all this can be done by having the mill properly set out at the start.

The steam plant and chimney should be erected outside of the mill against a dead wall, and at such an angle as to insure that the smoke shall be carried by the wind away from instead of over the mill for the greater part of the year.

A Home for Commercial Travelers.

At least 60,000 visitors were present in Binghamton, N. Y., on the 9th inst. on the occasion of the laying of the corner stone of the home of the Commercial Travelers' Association of America, quite 8,000 of whom were commercial men gathered from all over the country to participate in the event.

The principal feature of the morning was the convention of the Commercial Travelers' Home Association of America, which assembled in Stone Opera House. The convention was called to order by President James B. Aldrich, of Detroit, and Mayor George E. Green delivered the address of welcome. Secretary Booth presented a report stating that he had received a check from the Binghamton Site Committee for $8,000, making the total assets of the association more than $21,000, which is exclusive of the site of 100 acres of land and $15,000 worth of improvements.

The parade was the largest ever seen in Southern New York, and was composed of eleven divisions. The first was headed by the city police force and Grand Marshal Charles S. Case and staff. The Twentieth Separate Company acted as escort for Governors Flower and Pattison and their staffs. Then came the National Board of Managers and other officials connected with the home, and city officials in carriages. The second division consisted of Grand Army posts, Sons of Veterans and Patriotic Sons of America. Odd Fellows, Red Men and other civic organizations and the city Fire Department made up the next four divisions, and then came the members of the Commercial Travelers' Association of America, the Buffalo, Rochester, Syracuse, Elmira, Utica, Albany and other State delegations, comprising the seventh division. The eighth was composed entirely of the Pennsylvania members of the association. Next came the Masonic division, the ninth consisting of local and visiting lodges and the Grand Lodge of the State of New York, followed by the Sixth Battery, N. Y. S. N. G., as the tenth, with the Binghamton Wheelmen bringing up the rear as the eleventh division. Each division was headed by a band, and it is estimated that 20,000 men were in line.

On arriving at the home John Hodge, Most Worshipful Grand Master of the Free and Accepted Masons of the State of New York, laid the corner stone according to the Masonic ritual. In his address he gave a succinct history of the association from the time the first charter was granted to an organization of commercial travelers at Syracuse, N.Y., in 1872, down to the present time, giving in detail the movement to found a home from its incipient stages at Jamestown, N. Y., in 1891, to the present brilliant culmination of their efforts at Binghamton, the first Commercial Travelers' Home in the United States. He also stated that the association has already in contemplation another home in a milder climate, a school near Chicago, and a hospital to be located near the Rocky Mountains.

Col. Archie Baxter, of Elmira, N. Y., delivered the oration of the day, after which Governor Flower and Governor Pattison made short speeches, in which each eulogized the commercial travelers and said many pleasant things for the home.

Thick Boiler Fires.

The *Engineering Record* states that it is the opinion of some that it is necessary when a boiler is worked at a high rate of capacity to maintain correspondingly heavy fires. Valuable information has recently been brought out by the results of two evaporative tests on a 72 inch return tubular boiler having 100 3½ inch tubes 19 feet in length. On the thick fire test the depth of the coal on the grate varied from 6 to 20 inches; on the thin fire test the depth was maintained uniformly at about 6 inches. The ratio of heating surface to grate was 45.6 to 1. The result of the test was as follows:

	Condition of Fires. Thick Fires.	Thin Fires.
1. Average boiler pressure.....pounds	131.6	130.4
2. Average temperature feed water....degrees	39.6	43.5
3. Average temperature of flue gases.....	484	487
4. Average draught suction .....inches	0.17	0.18
5. Percentage of moisture in steam.....	.35	....
6. Coal per hour per sq. ft. of grate.....lbs.	13.72	12.0
7. Percentage of ashes and clinkers.....	5.1	5.7
8. Horse power developed on a basis of 30 pounds from 100 at 70.....	149.3	144.4
9. Water evaporated per pound of coal..pounds	8.517	9.457
10. Equivalent evaporation per pound of combustible from and at 212 degrees.....pounds	10.985	12.234

The best belting has a firm, solid character, while at the same time it is pliable.

New Inventions—LIV.

[WRITTEN FOR THE PAPER TRADE JOURNAL.]

By Geo. Damon Rice.

There are several processes in use for spinning strands of paper into yarns. Most of these are rather slow in their operation, and consequently the cost of spinning is increased. There is a new method by which the process of cutting and spinning the strands is done with rapidity. Instead of doing the twisting on the drawing out and spinning plan, the twist is put into the strand on the stationary ring principle. Large spinning mules are needed in the former case, while in the latter a section or so of a twisting and winding frame is sufficient. A chief fault in the use of the present paper yarns is that it has cost almost as much to make them as cotton. Paper stock is comparatively cheap, so it follows that a large proportion of the cost is in the labor. This hinders the universal use of paper yarns in a great many places where they would work to even better advantage than cotton, jute, hemp, &c. In order to put the necessary twist into the yarns it is essential that they shall be strong, otherwise they will not stand the strain and will cause endless trouble by continually snapping off. The result is that manufacturers have to employ a very good character of stock from which to make the yarns. All of this means increased cost. By the new process very inferior stock can be readily spun.

An idea of the construction of the apparatus to be used for putting twist into paper for yarn purposes can be obtained by examining Figure 1. In this illustration the letter A marks a roll of paper. Common paper in sheet form and exceedingly thin is used. Just below the roll of paper is a beam, C, in which is fixed a series of blades about an inch apart. The sharp sides of the blades are up and the points project through the sheet of moving paper and cut it into strips an inch in width. There are a series of draft rollers which serve to guide the strips, and these are indicated by D. Then the divided strips of paper pass downward to the rollers E, whence they are delivered to the twisting mechanism. The twisting mechanism consists of the guide plate G, the bobbins F and the cylinder for turning the spindles, the cylinder being indicated by H. The steps upon which the spindles turn are set in the brace I. The enlarged view in Fig. 2 sets forth the principle more fully. In this figure the strips of paper are designated A. There are three strips and these must be twisted into a thread. The rollers B will be noticed. These vibrate through the action of an eccentric and rub the three strands of paper into round shapes so that they emerge in the form shown at C. The rapid revolutions of the spindle on which the bobbin E

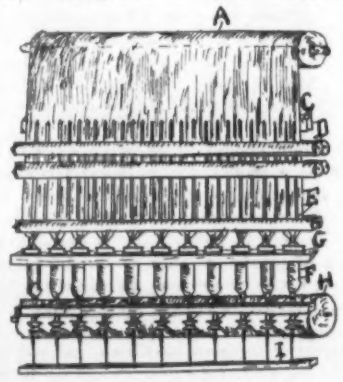


Fig. 1.—Improved Process of Twisting Paper Yarns.

is located causes the thread to describe a circle, carrying with it the little traveler D, which runs on the flanges of the ring F. Every revolution of the bobbin and the traveler means a turn in the strand. As the whole turns at the rate of several thousand times per minnte, it can be seen that the

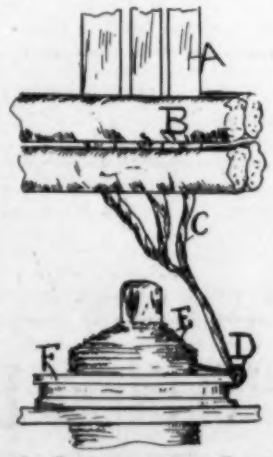
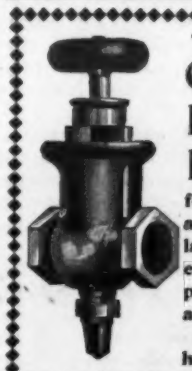


Fig. 2.—Principle of the Twisting.

strand is quickly twisted. As fast as twisted the yarn winds automatically on the bobbin.

The process thus consists of dividing the sheet of thin paper into strips an inch wide and spinning these into yarns by the ring frame process. The improvement over the older processes lies mainly in the way that the roll of thin paper is cut into strips, and in the fact that an endless strand can be produced with rapidity. Several additional features are the processes for applying color and variously colored strips for the purpose of making fancy twist yarns on the knickerbocker plan. The sheets are dyed any color and run in singly or double. By employing certain let-off and stop motions some very complicated and strikingly effective designs are produced in the yarns. By using a polishing connection at the rollers used for guiding the strands the yarns are rendered glossy and are applicable for use in a wide range of fabrics. Of course they are not used alone in cloths intended for clothing purposes. The paper yarns when thus applied are used for backing, or for interior texture in heavy goods. For striping purposes in plaids and stripes the colored paper yarns are useful. Being made quickly and of cheap stock, it follows that the yarns themselves are cheaper than those belonging to the textile class. The colors are fast when applied right.



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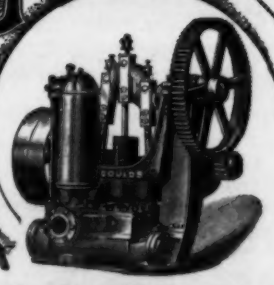

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Manufacturers of Straw Boards, Pulp Lined Boards, Lined Straw Boards, Combination Boards, Binders' Boards,

"LIGNISTRA." Friction Boards, Building Board, Plain Board, Tarred Board, Waterproof Boards, Barrel Layers, Peach Baskets, Egg Cases and Fillers.

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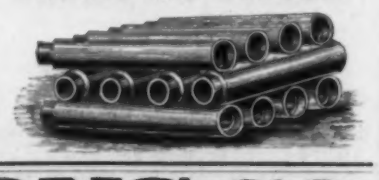

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It is superior to any other Roofing and unequaled for House, Barn, Factory or Outbuildings; it costs half the price of shingles, tin or iron; it is ready for use and easily applied by anyone: it is the best roofing in the market in durability. Send for estimate and state size of roof.

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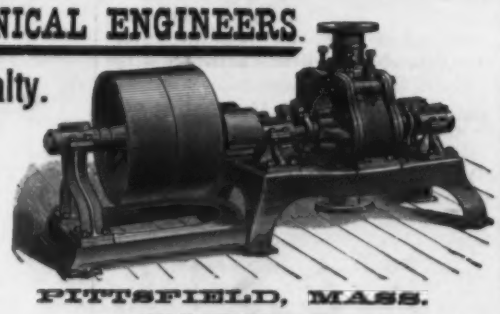
Paper Mill Plans a Specialty.



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OF ANY SHAPE OR CAPACITY.

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Illustrated Catalogue upon application.

Imports and Exports.

IMPORTS AT NEW YORK.

FOR THE WEEK ENDED OCTOBER 8, 1894.

An. Colors..	819	$53,184	Paper.....	751	$36,856
Alum.....	3	84	Steel Pens...	6	3,445
Alum's Cake	—	—	Stationery...	19	1,242
Bl. Powders	418	9,082	Slate Pencils	389	2,179
Soda Ash...	4,106	14,743	Clay.....	—	1,372
Soda, Caus.	278	4,088	J'te B'ts, &c.	—	—
Soda, Sal....	640	711	P. Hangings	11	393
Soda, Hypo.	28	191	P'p'r Stock..	4,754	42,244
Ultramarine	50	1,533	Terra Alba..	—	—
Books.....	435	60,407	Waste.....	54	12,843
Newspapers.	221	7,212	Wood Pulp..	930	6,410
Engravings.	124	11,372			
Ink.....	97	1,910			
Lead Pencils	12	3,103	Totals....	14,195	274,506

Imports General Merchandise for the week ended October 8, 1894..... $6,740,587

IMPORTS OF PAPER STOCK AT NEW YORK.

FROM JANUARY 1 TO OCTOBER 9, 1894.

Whence Imported.	Rags.	Old Papers.	Chemical Fibre.	Ground Wood.	Manilla Stock.
	Bales.	Bales.	Tons.	Tons.	Bales.
Alexandria...	1,349	....	....	....	....
Antwerp.....	1,575	303	719	....	12,076
Aspinwall....	90	....	....	....	....
Bordeaux.....	684	....	....	....	....
Bremen.....	672	95	6	....	6,978
Bristol.....	....	....	....	....	3,551
Buenos Ayres.	157	....	...	....	....
Calcutta.....	....	....	....	....	3,063
Cent. America	130	....	....	....	....
Christiania....	....	....	580	....	749
Copenhagen..	700	....	1,296	....	1,929
Dublin.....	....	186	....	....	....
Dundee.....	....	....	....	....	882
Dunedin.....	....	....	....	....	183
Fiume.....	....	....	99	....	....
Geestemunde.	252	....	....	....	1,309
Genoa.....	....	....	....	....	4,350
Glasgow.....	594	77	18	....	523
Gothenburg..	91	....	107	....	....
Hamburg.....	1,900	276	535	....	4,003
Hamilton.....	....	....	....	....	42
Hiogo.....	9,001	....	....	....	....
Hong Kong...	43	....	....	....	....
Hull.....a	2,832	185	1,188	....	15,456
Kobe.....	34,895	....	....	....	....
Leghorn.....	2,384	....	....	....	....
Leith.....	....	159	....	....	188
Liverpool.....	1,256	899	....	....	22,809
London.....	4,856	2,046	20	....	10,502
Marseilles....	466	....	....	....	486
Nassau.....	40	....	....	....	15
Newcastle....	....	286	....	....	3,892
Rio.....	26	....	....	....	....
Rotterdam....	2,262	119	717	....	9,630
Southampton.	....	....	....	....	160
Stettin.....	3,905	....	760	....	8,891
Trieste.....	....	....	49	....	....

a. Including 347 bales cotton waste.

NEW YORK IMPORTS.

FROM OCTOBER 2 TO OCTOBER 9, 1894.

Paper Stock.

N. H. Heyman, Waesland, Antwerp, 1 ton chemical fibre.
Lewy Brothers, Hekla, Copenhagen, 265 bs. rags, 98 bs. bagging.
F. Salomon & Co., by same, 188 bs. bagging.
Perkins, Goodwin & Co., by same, 25 tons chemical fibre.
R. H. Overton & Son, Critic, Dundee, 128 bs. manillas.
J. Libmann & Co., Peruvian, Glasgow, 42 bs. rags.
J. W. Mason & Co., Galileo, Hull, 218 bs. manillas.
Train, Smith & Co., by same, 101 bs. bagging.
F. Salomon & Co., Marsala, Hamburg, 72 bs. rags, 108 bs. manillas.
Castle & Gottheil, Venetian, Stettin, 13 tons chemical fibre.

Paper.

L. De Jonge & Co., Marsala, Hamburg, 16 cs. colored.
B. Lawrence Stationery Company, Germanic, Liverpool, 8 cs.
Wilkinson Brothers & Co., by same, 10 cs.
W. H. S. Lloyd, New York, London, 5 cs. hangings.
L. De Jonge & Co., Rhaetia, Hamburg, 32 cs.
R. J. Cortiz, by same, 6 cs.
R. P. Downing & Co., by same, 30 cs.
Henry Lindenmeyr & Sons, Veendam, Rotterdam, 36 cs.
G. W. Sheldon & Co., by same, 67 cs.
Geo. J. Kraft, by same, 4 cs.
Dennison Manufacturing Company, Etruria, Liverpool, 20 cs.
M. Adler, P. Caland, Rotterdam, 23 cs.
Henry Gade, by same, 5 bs.
Henry Allen, La Bourgogne, Havre, 33 cs.
American Trading Company, by same, 42 cs.
J. C. Druckliob & Co., by same, 22 cs.
May Brothers, by same, 3 cs.
L. De Jonge & Co., Friesland, Antwerp, 23 cs.
L. C. Wagner, by same, 5 cs.
Manhattan Optical Company, by same, 1 cs.
Henry Gade, by same, 13 cs.
Rudolph Sulzberger, by same, 13 cs.
Dingelstedt & Co., by same, 3 bs.
O. G. Hempstead & Co., by same, 6 cs.
Oscar F. Melvin, by same, 2 cs.
American Aristotype Company, by same, 45 cs.
Photo Material Company, by same, 45 cs.

BOSTON IMPORTS.

FROM OCTOBER 4 TO OCTOBER 10, 1894, INCLUSIVE.

Paper, &c.

Hooper, Lewis & Co., British Queen, London, 5 cs. stationery.
Wm. Guild & Co., Cephalonia, Liverpool, 5 bs. periodicals.
A. P. Schmidt, by same, 2 cs. printed music.
Gregory & Brown, by same, 2 cs. paper hangings.
W. A. Nosworthy, by same, 16 cs. paper.
Dennison Manufacturing Company, by same, 58 pkgs. tissue paper.
Order, Chicago, Columbian, Liverpool, 30 rolls paper.

Paper Stock.

Train, Smith & Co., Venetian, London, 296 bs. rags.
Horace Dutton & Co., by same, 131 bs. waste paper.
Crocker, Burbank & Co., by same, 140 bs. waste paper.
Train, Smith & Co., Galileo, Hull, 235 bs. rags.
Felix Salomon & Co., by same, 100 bs rags.
Horace Dutton & Co., British Queen, London, 49 bs. rags.
Wheelwright Paper Company, by same, 101 bs. waste paper.
Train, Smith & Co., Michigan, Liverpool, 223 bs. manillas.
True & McClelland, by same, 183 bs. waste paper.
R. H. Overton & Son, by same, 131 bs. manillas.
C. A. Cheney, Columbian, Liverpool, 549 bs. rags.

Chemical Fibre.

F. Bertuch & Co., Galileo, Hull, 280 bs.

Sizing.

Warren & Co., Michigan, Liverpool, 140 bags.

Bleaching Powder.

J. L. & D. S. Riker, Michigan, Liverpool, 260 cks.
Fuerst Brothers, Cephalonia, Liverpool, 37 cks.
Bowman, Thompson & Co., Galileo, Hull, 50 cks.

Caustic Soda.

Edward Hill's Son & Co., Michigan, Liverpool, 50 drums.

Soda Ash.

Wing & Evans, Cephalonia, Liverpool, 77 cks., 1,200 bags.
Warren & Co., Michigan, Liverpool, 37 cks.
Wing & Evans, Columbian, Liverpool, 59 cks., 400 bags.
Bowman, Thompson & Co., by same, 200 bags.

Crude Sulphur.

Linder & Meyer, Columbian, Liverpool, 3,336 bags.

Pulp Stones.

Lombard & Co., Galileo, Hull, 21 stones.

China Clay.

True & McClelland, Michigan, Liverpool, 110 bs.

PHILADELPHIA IMPORTS.

FOR THE WEEK ENDED OCTOBER 6, 1894.

Paper.

Chas. Beck Paper Company, Lord Gough, Liverpool, 15 pkgs.

Paper Stock.

Heidelback, Ickelheimer & Co., Lord Gough, Liverpool, 50 bs. bagging.

Soda Ash.

Brown Brothers & Co., Lord Gough, Liverpool, 35 cks.

EXPORTS of Paper, &c., from New York for the Week Ended October 9, 1894.

BOOKS, cases, to Liverpool, 17; Brazil, 131; Hamburg, 5; Southampton, 4; British possessions in Africa, 71; Glasgow, 7; Newfoundland, 23; Mexico, 41; Nova Scotia, 2; Porto Rico, 1; San Domingo, 3; Central America, 1; Dutch West Indies, 2; Geneva, 22; Leipsic, 11; Munich, 1; Antwerp, 1; Colombia, 17; Argentine Republic, 1; Berlin, 1; Bremen, 3; British Australasia, 10; Cuba, 1; Constantinople, 4; French possessions, 20; Havre, 12.

PAPER, to Cuba, 459 pkgs.; British West Indies, 468 pkgs.; London, 106 pkgs.; Central America, 20 cs.; Liverpool, 36 cs.; Mexico, 87 pkgs.; Venezuela, 5 cs.; Hayti, 4 pkgs.; Hamburg, 25 cs.; Porto Rico, 13 cs.; Uruguay, 10 cs.; Zurich, 2 cs.; Leipsic, 3 cs.; Newfoundland, 44 bdls.; Argentine Republic, 9 cs.; Brussels, 52 pkgs.; Colombia, 18 pkgs.; Bremen, 6 cs.; British Australasia, 508 pkgs.; Brazil, 61 pkgs.; Christiania, 14 cs.; Dutch West Indies, 14 pkgs.; Danish West Indies, 11 pkgs.; San Domingo, 109 cs.; Leith, 74 cs.

STATIONERY, cases, to Danish West Indies, 9; Cuba, 11; Central America, 31; Colombia, 9; Liverpool, 1; Venezuela, 14; Bremen, 1; Hayti, 9; Mexico, 10; Nova Scotia, 22; New Zealand, 1; San Domingo, 6; Havre, 1; Newfoundland, 18; New Brunswick, 2; Antwerp, 3; Argentine Republic, 12; British Australasia, 26; Brazil, 5; Copenhagen, 7; Dutch West Indies, 2; Havre, 1; Porto Rico, 10.

CARDBOARD, cases, to Cuba, 1; Danish West Indies, 1; Venezuela, 2.

STRAWBOARD, cases, to Cuba, 6.

AGGREGATES AND VALUES.

Paper, reams.....	—	—
Paper, pkgs.....	1,916	$10,698
Paper, cases.....	238	4,134
Books, cases.....	280	14,260
Stationery, cases.....	905	10,141
Rosin, bbls.....	9,618	19,006
Totals.....	12,357	$58,248

Exports General Merchandise for the week ended October 9, 1894..... $7,158,881

As it is the nature of leather to possess a degree of elasticity, it is reasonable that a belt should stretch to some degree under strain; and while a well made belt must be reasonably rigid against stretching in use, yet to take all the stretch out of a belt in its manufacture would imply to strain it beyond the just limit due to its nature.

Fireproof Paint.

A London journal prints the following from the letter of a correspondent: "I find that painting woodwork of any kind with several coats of solution of silicate of soda, and finishing with a mixture of this solution and sufficient whiting to make it about as thick as ordinary paint, is an excellent protection against fire. Wood treated in this way will not take fire from mere contact with flame; it requires to be heated till destructive distillation begins; then, of course, gases are given out which ignite and the wood is gradually converted into charcoal, but until destructive distillation takes place the coated wood will not support combustion. A few years since I had some screens made like ordinary doors, some prepared as I have described and some not. They were then placed over a fire of shavings which was kept constantly renewed. In ten minutes the unprepared screens were blazing away and so nearly consumed that they had to be supported by an iron bar. The flames continued to lick the prepared screens for thirty minutes before the distillation commenced. After forty-five minutes the coated screens were still intact and able to support themselves; they held together for an hour, although pierced in many places with holes, and when the fire was removed they did not continue to burn. This was a splendid success, and I still have the remains of the screens."

CHRISTIANA MACHINE CO.,
Christiana, Pa.,
MANUFACTURERS OF
THE BALANCED GATE
Turbine Wheel.

Suitable for Light or Heavy Service.
Globe Outer-Cases and Special Wrought or Cast Iron Flumes,
SUITABLE FOR ANY SITUATION.
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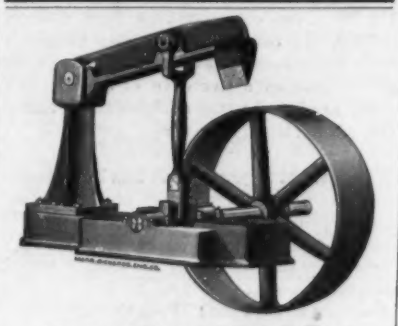

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NEW YORK: SATURDAY, OCTOBER 13, 1894.

THE CHEMISTRY OF PAPER MAKING is now on the market; octavo, 532 pages, cloth, $5.00, postpaid. Every reader of THE PAPER TRADE JOURNAL interested in the subject could not make a better investment of the money. Particulars in another column.

In press: HOFMANN'S TREATISE ON PAPER MAKING; to be published in twenty parts of about eighty pages each, at intervals of not less than sixty days; price *one dollar* cash in advance for each part, postpaid. Number One will appear in November next. Subscribers should not delay in placing orders.

THE AMERICAN DICTIONARY OF PRINTING AND BOOKMAKING will be delivered to any person sending twelve dollars for it. This great work, royal octavo, 600 pages, half-bound, is a mine of information on every subject comprehended by its title.

HOWARD LOCKWOOD & CO.

THE CHEMISTRY OF PAPER MAKING has been on the market since the first week in September, and has sold more largely than was anticipated, orders being received and filled every business day. As the merits of the book become more generally known, it will be in yet greater demand. It is destined to become a standard work in the trade, and will find its way into every leading library and college.

AN electrolytic apparatus to be employed in the production of bleaching solutions is the subject of illustration and description on the first page of this issue of THE PAPER TRADE JOURNAL. It is adapted for attachment to high or low tension electric currents, as may be desired, and the arrangement differs materially from that ordinarily employed in electrolytic apparatus.

THE proposed English syndicate to take over the Fox River Valley paper mills has run up against a snag. While it was not so difficult a matter to secure options on the various mills and, as we understand, at very good figures, it seems that the promoter of the scheme did not know until his negotiations with the paper manufacturers were concluded that the water power was not one of the elements of the purchase. This important advantage is yet to be secured and if conceded will involve a larger expenditure of money than has yet been contemplated.

THE coming elections, particularly that in the State of New York, will make a large demand for paper. The ballots to be used in this State are not only large, but numerous, for the reason that in addition to the executive, judicial, legislative, municipal and county offices for which nominations have been made by the various parties, regular, irregular and bolting organizations, the new constitution, besides other independent constitutional amendments, are to be submitted to a vote of the people.

IN the distribution of prizes made by King Leopold at the Antwerp Exhibition on October 2 the United States seem to have fared better than was anticipated, having received 122 awards. Americans who visited the Antwerp Fair have been loud in their condemnation of the exhibit of the United States. The space allotted to this country was, after that given Belgium and France, the largest reserved for any nation. It was inadequately filled, and the general character of the exhibits was inferior, while the methods employed by some of the exhibitors were, it is said, governed by their great desire to convert their wares into money, and not by any patriotic considerations. Under the circumstances the number of awards is surprising, although insignificant enough when compared with the 2,733 of France, Germany's 706, England's 363 and Belgium's 2.470. While it is true that international exhibitions are becoming too numerous and expensive, those who elect to take part in them should remember that for the time being at least they represent the dignity of the country.

WE had occasion to refer last week to the increasing demand for small bills as an indication of improving conditions in all departments of trade. "Straws show which way the wind blows," and so these little pointers indicate the drift of affairs in the business world. We can this week refer to the improvement in railroad earnings as indicated in weekly and other reports, as evidence that "things are picking up." While it is true that the gross earnings and profits of the railways do not yet greatly exceed those of last year, we have to remember that the World's Fair was the vital factor of that year in keeping the roads of the country on a paying basis. Their immense earnings were largely from passenger traffic. This year, however, the passenger business has been normal, and therefore it is an unavoidable conclusion that the movement of freight must have increased greatly in order to sustain and exceed the results of last year. This means that industrial activity — that is, manufacturing and trading—is very much greater than in 1893, and what is more to the point, that the increase continues. Another little business straw is the great increase in the postal revenues. During the third week in September 35,000,000 postage stamps were ordered from the Bureau of Printing and Engraving; in the following week 65,000,000 were ordered, and for the next week 69,000,000 were called for. This certainly shows that people, presumably business men, are writing more letters. It should also encourage the paper trade.

JUSTICE HARLAN, of the United States Court of Appeals, has handed down an opinion in the matter of the injunction orders issued by Judge Jenkins eight months ago, when the Northern Pacific employees began to strike against a reduction of wages, which practically overrules the unusual position taken by that judge. The original injunction laid down the doctrine that men could not lawfully quit unsatisfactory employment when such action was likely to interfere with the running of a railroad or inflict injury upon property; that there is no legal right to strike, and that the courts are competent to compel men to continue in their employment under conditions of wages and work unsatisfactory to themselves. The language of the restraining injunction is as follows: "And from combining and conspiring to quit, with or without notice, the service of said receivers with the object and intent of crippling the property in their custody, or embarrassing the operation of said railroad, and from so quitting the service of said receivers, with or without notice, as to cripple the property or to prevent or hinder the operation of said railroad, and generally from interfering with the officers and agents of said receivers, or their employees, in any manner by actual violence or by intimidation, threats or otherwise, in the full and complete possession of the road." This doctrine is not indorsed by the higher court, which says that such a law would enable the courts to bind men to "involuntary servitude," a condition forbidden by the Constitution. Justice Harlan rules that a man may and has the right to quit his employment either individually or in company with others, and that the consequences of such quitting in no way modifies or impairs his right to do so. While this right is maintained employees of railways operated by the United States, and incidentally all other railways may, he says, justly be restrained by the courts from using violent methods in enforcing their strike, intimidating other employees remaining at work, or destroying property. In other words, they may lawfully employ all peaceful means in maintaining their cause. The peaceable railway strike in which nobody will be inconvenienced is a rosy and millennial vision, of course, but some way will, doubtless, be found before long by which the employees of public utilities, like railways, will and should be brought under some control without interfering with or curtailing their personal freedom and rights.

Watermarks.

BY DANDY.

Mill agents, paper dealers and stock men in town have been receiving appeals "in confidence" from a "paper maker's foreman" who lives in Maryland. The letters have been coming along from time to time for a year, and there are now two before me, one dated last April and one in the present month.

Most of the people who receive these letters do not know the writer of the appeals, and throw them aside. He makes about the same statements in each letter; but it is noticeable that he now has six children, while in April he had only four. He may be all right and entitled to assistance, but many of the recipients do not think so.

At any rate they think that those whom they know are entitled to their first consideration.

According to Uncle Sam's statistics our export trade in the paper line shows progress. For the eight months ended August 31, 1894, we exported $1,343,379 of paper and its manufactures, as against $1,112,726 in the corresponding eight months in 1893. In this account paper hangings show an increase of $19,063; writing paper and envelopes a decrease of $21,905, and other grades of paper an increase of $233,495. Now, then, keep it up!

Out West a gentleman has been seeking to buy up a lot of paper mills. He secured options on the mills, but seemed to have forgotten that water power was a very necessary auxiliary to such a manufacturing plant, and now he has delayed his departure for the "H'old Country" until he gets a figure on this little forgotten item.

The oil, paint and drug men, among whom were a number of chemical men, recently held a week's convention in this town. It is stated on very trustworthy authority that during the meeting the price of vermilion advanced 5 cents a pound.

The gentleman who makes the statement is a dealer in the coloring material named and states the matter as a fact, leaving comments to take care of themselves.

Plain, ordinary red never "jumped" like this even during Saratoga's palmiest days. However, I will say nothing until the record of the midwinter meeting of the A. P. M. A. has gone into the pages of history.

There was a failure in the paper trade in town this week and a New York dealer on hearing that a certain manufacturer had a large sized ticket to the creditors' meeting, said: "What! why, I advised a friend of mine to sell that house because that manufacturer, who I thought was very conservative, was selling them largely. Well, I'll be—jiggered!"

That manufacturer, by the way, ran up against a bunco game this week. He stopped in to see a concern with whom he does a large business. One of the three partners who were present said: "What'll you give for our claim?" "A lunch for all of us," was the reply. The lunch was had, the check for it was about $16, and it then turned out that the claim was only $6.90. It is ever thus with the poor paper maker. His innocent ways make him an easy mark for the wicked who take him in and "do" for him.

Well, it is said that the modern golden rule is "Do others or they'll do you."

Trade Talks.

John G. Luke, Piedmont Pulp and Paper Company, West Virginia Pulp Company and West Virginia Paper Company, New York—Business with us is very good in pulp and paper, and in both we have all we can swing to. Trade seems to come in waves. There is a wave of orders and then it drops off, but the succeeding wave is a little higher, and so it goes, the volume of business growing gradually larger and larger. Prices, I think, have reached bottom, and where there are concessions in price there are also concessions in quality; but for equal quality I do not think manufacturers are inclined to yield their ideas.

Capt. F. L. Stevens, of Thompson & Stevens, North Hoosick, N. Y.—Business keeps up very well, and our main trouble for some time has been low water. Orders have been crowding, but we have been unable to make full product because of the low streams. We had some rain this week, and when I left the mill last Wednesday the water was beginning to rise.

W. F. Dodge, Manchester, England—I came over in the Etruria, and we had the nastiest trip I have ever experienced. It was very rough, and the passengers were tossed about a great deal. Many were very sick, and all in all nobody enjoyed it at all. The Manchester Canal is working all right and is doing good service. It has reduced transportation and other charges, and Liverpool, which has had it all her own way heretofore, has been compelled to reduce her charges. Business has not been up to what it should be in England, but it has been relatively better than it has been in the United States.

Communications.

Hofmann's Treatise.

MANCHESTER, N. H., October 8, 1894.

Messrs. Howard Lockwood & Co.:

We have yours of the 1st pertaining to "Hofmann's Treatise on Paper Making." We know something of the standing of Mr. Hofmann among paper makers, both here and abroad. We were subscribers to his early publication and valued it highly. In some way it was lost or stolen and could not be found. While in Switzerland last year, I sent to Mr. Hofmann in Berlin, asking him to get for me another copy and send it to me at Berne. I paid him 100 marks for the same. I regard it as a valuable publication. We shall want the new work, and fill out your blank order for ten parts and inclose you our check for $10.

Very truly yours,
P. C. CHENEY COMPANY,
P. C. Cheney, President.

[We thank Governor Cheney for the order, and hope that all manufacturers will follow his good example. Hofmann's original Treatise was published twenty-one years ago and consisted of 422 pages. The 100 marks which the Governor paid for a copy were equal to nearly $24. We have sold second-hand copies for $25, and even $30. Hofmann's new Treatise will consist of about 1,600 pages, with nearly 1,500 engravings, and will be "up to date;" to be published in 20 parts at $1 each. Thus subscribers will receive a work nearly four times as large as the old book for less than the cost of a second-hand copy of it; and the usefulness of the new Treatise will be very much greater. —H. L. & Co.]

Sticks to It.

HULL, P. Q., October 10, 1894.

Editor of The Paper Trade Journal:

I see by this week's PAPER TRADE JOURNAL that J. P. Frampton does not believe the statement in regard to the run of seventy-six hours, without a break, made here. He will probably want to make me president of his "Order," when I tell you what is a fact, that this is not the first time that this mill has made such a run.

In this mill we have some of the best machines ever built; our sulphite is the strongest made in the country; the company gets us the best of clothing for our machines, and with the best of machine tenders that money can get to run our machines, why shouldn't they run well?

If the act of seeing such a run entitles one to be called a liar, all the help in our No. 1 Mill are entitled to membership in Mr. Frampton's society.

GEO. H. HARVEY,
Ass't Supt. E. B. Eddy Company,

A Veteran Paper Maker.

NEWTON, Mass., October 8, 1894.

Editor of The Paper Trade Journal:

The following item, cut from the Newton, Mass., *Graphic*, has something more than a local interest:

"The Newton board of health returned this week from its trip to Philadelphia and other cities, undertaken for the purpose of inspecting the system in these cities for removal of garbage. While at Wilmington, Del., Frederick Curtis, of the board from this place, was present at a very happy occasion on the 5th, it being the celebration of the "golden wedding" of his uncle, Solomon Minot Curtis, of Newark, near Wilmington, occurring on the evening of that day. The event was more notable for its having been the second of like character in the family, an older brother, Wm. Curtis, of this city, in 1873 having celebrated the fiftieth anniversary of his marriage. The groom of the happy occasion will be remembered by many citizens of Newton as a former resident who went South many years ago to engage in the manufacture of paper in that region. The bridesmaid and groomsman of the occasion were the same as at the original ceremony conducted by the pastor of St. Mary's Church of this village, who also officiated at the marriage of William Curtis."

Solomon M. Curtis, of the firm of Curtis & Brother, Newark, Del., whose golden wedding occurred as stated above, was the youngest of nine brothers, born in Newton, all of whom were well known paper makers and prominent in the business. Mr. Curtis is the sole survivor of this once noted family, and notwithstanding his seventy-six years, is yet vigorous and active. F.

Changes, Removals and New Firms.

R. L. Wheeler, publisher, Ireton, Ia., has sold out.

The *New Era*, Montfort, Wis., has suspended publication.

The *Graphic*, Chicago, Ill., has suspended publication.

The *Courier*, Ogdensburg, N. Y., has suspended publication.

The *News*, Ridgewood, N. J., has been sold to Baxter & Babcock.

Nugent & Brown have started a bookbindery at Duluth, Minn.

The *Evening Journal*, Williamsport, Pa., has suspended publication.

Watson & Davis, printers, Leighton, Pa., have dissolved partnership.

J. E. Evans, bookseller and stationer, North Platte, Neb., has sold out.

Stapleton, S. I., has a new humorous weekly paper called *Yours Truly*.

The *News and Dairyman*, Harland, Wis., has been sold to H. D. Goodwin.

The *Fentress County News*, Jamestown, Tenn., has been sold to F. B. S. Morgan.

St. Joseph, Mo., has a new society journal called *Chat*, edited by Lucille Barker.

Norwalk, Ohio, has a new German paper called the *Merkur*, edited by Paul Herter.

Perkins, Goodwin & Co. have opened a Philadelphia office at 519 and 521 Jayne street, where J. S. Armstrong is in charge.

The *Congregational News*, Lowell, Mass., has been succeeded by the *Lookout*.

Fred Pelton has bought the business of Henry R. Conant, bookbinder, Appleton, Wis.

F. C. White, paper box manufacturer, Biddeford, Me., will remove to Newburyport.

R. H. Bullwinkel has opened a stationery store at 176 East Fifty-seventh street, New York.

Cincinnati, Ohio, is to have a new political monthly called the *Republican Magazine*.

New York has a new class journal called the *Conductor and Driver*. Its mission is obvious.

Henry Reed, publisher of the *Herald*, Sweet Springs, Mo., has sold ut to N. A. Jamison.

McPherson, Kan., has a new weekly paper called the *Signal*, edited and published by N. Lee.

Louisville, Ky., has a new journal called the *Southern Cycler*, published by a joint stock company.

The job printing department of the *Dispatch*, Erie, Pa., was recently sold to W. J. Robinson, A. F. Moses, W. C. Cramer

and Daniel McCarthy, forming the *Dispatch* Printing and Lithographing Company, Limited.

C. H. Smith, bookseller and stationer, St. Stephens, N. B., has given up business, owing to ill health.

Portland, Ore., has a new journal called *Frater*, devoted to the interests of fraternal organizations.

Morrice, Mich., has a new weekly paper called the *News*, edited and published by Harry H. Turner.

Kaufman, Tex,, has a new daily paper called the *Register*, edited and published by Robert Carver.

W. W. Hart, printer, Grand Rapids, Mich., has been succeeded by the White Printing Company.

Wilmington, Del., has a new paper called the *Reformer*, published in the interest of the People's Party.

Fletcher & Hood, publishers of the *Daily Index*, Terrell, Tex., have been succeeded by George N. Appleby.

W. J. Thompson & Co., paper dealers, Boston, Mass., have removed their offices to 207 Congress street.

Dunkirk, Ind., has a new daily paper called the *Herald*, published by Whitaker, McElwain & McKittrick.

Salt Lake City has a new weekly paper called the *Liberalist*, devoted to reviews of subjects of general interest.

The *Day Globe* and the *Evening News*, Waco, Tex., have been consolidated under the name of *Morning News*.

Ithaca, Mich., has a new weekly paper called the *Gratiot County News*, edited and published by Smith & Elliot.

Ogden, Utah, has a new weekly paper called the *Weber County Press*, published by the *Press* Publishing Company.

B. W. Hunter, publisher of the *Evening News*, Austin, Tex., has been succeeded by the Hutchins Printing Company.

The Caledonia Publishing Company, publisher of the *Republican*, St. Johnsbury, Vt., has gone into the hands of a receiver.

The *Wisconsin Patriot* Company, publisher of the *Wisconsin Patriot*, Milwaukee, Wis., made a voluntary assignment on October 5.

S. Cusitar, Portage La Prairie, Man., has bought the stationery stock of the late D. Jenkins, of Morden, and will continue the business.

The *Legal News*, Toledo, Ohio, has been sold to the Lanning Printing Company, Norwalk, Ohio, but will continue to be published at Toledo.

The White Printing Company, Grand Rapids, Mich., has been incorporated by A. S. White, H. C. White, H. A. Sprik and W. A. Shaw. Capital stock, $10,000.

The Brown Brothers Stamp and Printing Company, Peoria, Ill., has been incorporated by B. F. Brown, Burt Brown and George B. Upham. Capital stock, $5,000.

The Harpoon Publishing Company, Tyler, Tex., has been incorporated by J. S. Bonner, A. Offenbuttel, C. W. Boon, John M. Duncan and Albert Schub. Capital stock, $10,000.

The Anzeiger Publishing Company has been incorporated to publish newspapers and do a general printing business in Schenectady, N. Y.; capital, $12,000, and directors, Ernest Knauer, Charles Bickelmann, S. M. Miller, George Franestadt and Julius Knopf.

The Deardorff Paper and Manufacturing Company, Chattanooga, Tenn., has been incorporated, with Charles L. Deardorff as president; Charles E. Custer, vice-president, and T. G. Stauffer, secretary-treasurer. Capital stock, $25,000. This concern is a consolidation of J. M. Deardorff & Son, wholesale paper dealers, and the Southern Printing and Manufacturing Company.

Failures.

Kennickell & Co., printers, &c., Savannah, Ga., have been closed by the sheriff.

Annie Switzer, stationer, Baltimore, Md., has made a deed of trust, for the benefit of creditors, to John B. McGraw. Liabilities, $1,000; assets, $600.

Edward Blumenstiel has been appointed receiver in supplementary proceedings for Jonas H. Marksohn, manufacturer of paper boxes, New York, in a suit brought by the New York Straw Board Company.

The University Press, John Wilson & Son, Cambridge, Mass., has made an assignment. The concern was one of the oldest printing houses in the country, having been established in 1636. It employed about 350 hands. A meeting of the creditors will probably be held next Tuesday afternoon. For the present it is likely that the work of the concern will not be interrupted. The first indication of trouble came three weeks ago, when John Wilson, the senior partner, learned that without his knowledge or consent Charles F. Wentworth, the junior partner, had issued a number of accommodation notes in the firm's name. The amount of these notes now outstanding is from $60,000 to $100,000.

W. A. Bingham & Co., a corporation dealing in paper and manufacturing paper flour sacks, 186 and 188 Franklin street, New York, made an assignment on Saturday last to Dunnelle Van Schaick. The officers of the company are Wells A. Bingham, president and treasurer, and Joseph Bataille, secretary. The company was incorporated in March, 1891, although Mr. Bingham was in business many years before that. The liabilities are estimated at from $75,000 to $90,000, and the nominal assets over $100,000. The company had an authorized capital of $100,000, of which $85,000 was paid in. A statement is now being prepared and will be presented at a meeting of the creditors to be held at Parlor 74, Astor House, New York, on Tuesday, October 16, at 1 o'clock P. M. In speaking of the failure, Mr. Bingham said: "We have had nothing except good words from our creditors, and those who are the most interested have advised the calling together of the creditors at an early date, and the making of arrangements to resume at once without sacrificing assets. Up to the time of the failure we had met every obligation; no paper had gone to protest, there were no attachments or suits, and there has been no talk of any litigation. We have done a large business, and the talk of our having sold goods recklessly and without profit is entirely without foundation."

Further details concerning the failure of C. M. Leighton, of Lincoln, Neb., have come East. It seems that last July he transferred $25,000 of real estate to the Equitable Investment Company, of which he claimed to be president and principal stockholder. The suits against him in their order are as follows: B. Illfelder & Co., attachment and garnishment, $723.25; United States Playing Card Company, attachment and garnishment, $202.76; Magic Introduction, $845.94; First National Bank, chattel mortgage, $17,911.98; Western Paper Manufacturing Company, attachment, $575.96; Carter, Dinsmore & Co., attachment, $1,602.02; Richardson Silk Company, $262.21; First National Bank, $265.76. Then come chattel mortgages, said to be made without the knowledge of the mortgagees, in the following order: Whiting Paper Company, $786.07; National Blank Book Company, $1,332.55; Thomas Kane Company, $1,195.48; S. E. & M. Vernon, $716.80; Boorum & Pease Company, $881.95; Sheffield Manufacturing Company, $3,494.80; Reynolds & Reynolds Company, $1,376.20, and Liebenroth, Von Auw & Co., $893.29. Since the giving of these mortgages suits have been started as follows: Tytus-Gardner Paper Company, attachment and garnishment, $755.73; Simmons Hardware Company, attachment and garnishment, $133.87; Crystal Soap Company, $292. Other claims not in suit aggregate $5,481.82, and it is estimated that there are further claims aggregating $10,000 not yet heard from. It is supposed that the stock invoices about $50,000. It is probable that there is plenty of litigation in sight.

At a meeting of the trustees of the Stationers' Board of Trade the following named firms were elected to membership: Ihling Brothers & Everard, Kalamazoo, Mich.; A. Edward Newton & Co., Philadelphia, Pa.; D. C. Heath & Co., Boston, Mass., and L. E. Waterman Company, New York.

Market Review.

OFFICE OF THE PAPER TRADE JOURNAL, FRIDAY, October 12, 1894.

THE MONEY MARKET.—The stock market was very irregular, and the majority of moving shares closed at lower figures. The loan market shows no improvement, and offerings on call continue heavy at 1 per cent. The scrutiny of collaterals is lenient, and securities having an active market are accepted without demur where the distribution is good. The commercial paper market is sluggish. Following were the rates quoted by brokers for loans on stocks and bonds that have a good market: 1½ per cent. for thirty days, 2 per cent. for sixty days, 2½ per cent. for ninety days, 3 per cent. for four and five months, and 3½@4 per cent. for longer terms. There was little doing in commercial paper. Quotations closed at 3@3½ per cent. for sixty and ninety day indorsed receivables; 3½@4 for commission house names and prime four month singles; 4@5 per cent. for prime six month singles, and higher for those not so well known. The foreign exchange market was practically unchanged to-day, though there was perhaps an easier tone in the dealings. Shipments of gold were no longer considered as probable for the week. The covering of short contracts and the requirements of importers remain the chief sources of demand. Posted rates were $4.87½ for sixty days and $4.88½ for sight. Actual rates were $4.86½@4.87 for sixty days and $4.87½@4.88 for sight.

THE PAPER TRADE.—There is little out of the ordinary routine in the paper market. A fair amount of business is reported; but it is somewhat irregular, being good one day and poor the next, the average being of such a character as to lead to the hope that there will be a gradual growth throughout the remainder of the year. Recent rains have helped paper makers to some extent, and streams are a little fuller, so that mills have been able to run with more regularity. Prices do not show a great deal of change. Even on orders which are desirable as to size, weight and quantity some makers are shy of, when it is expected that values are to be sacrificed. The demand for News grows; Manillas are more in demand, while Book is also receiving more favors. A local failure has furnished a topic for a good deal of talk which will probably be short lived, as the creditors' meeting is to be held early next week.

JUTE BUTTS.—The market is quiet and prices are without change.

WOOD PULP.—There is a demand for Ground Wood, and in this and neighboring States values remain on the high plane noted last week. Prices are irregular and are governed somewhat by the necessities of the buyer and the stock held by seller, but they range 1.10@1.20c.

WOOD FIBRE.—There is a little more doing in the Chemical Fibre market. Domestic Soda is quoted at 2¼@3c. for Bleached, and 2½c. for Unbleached. Domestic Sulphite is quoted at 1¼@2¾c., as to quality, for Unbleached, and 3½c. for Bleached. Foreign grades are quoted as follows: Unbleached Pine, soda process, 2.60@2.75c.; Bleached, same process, 3¼@3.90c.; Unbleached, sulphite process, 2.50@3.15c.; Bleached, do., 4@4½c.; Bleached Straw Pulp, 4@4½c. This week there were imported at this port 39 tons of Chemical Fibre, being 1 ton from Antwerp, 25 tons from Copenhagen, and 13 tons from Stettin.

FOREIGN RAGS AND PAPER STOCK.—The demand for foreign rags is quiet. There have been some small sales, but as a rule there are no transactions of importance, the difficulties which mills are encountering in the way of low water being reflected in the raw material market. Imports for the week aggregated 1,220 bales and 39 tons, being 379 bs. rags, 39 tons chemical fibre and 841 bs. manillas. Ports of shipment and quantities are as follows: Antwerp, 1 ton chemical fibre; Copenhagen, 265 bs. rags, 25 tons chemical fibre and 286 bs. manillas; Dundee, 128 bs. manillas; Glasgow 42 bs. rags; Hamburg, 72 bs. rags, 108 bs. manillas; Hull, 319 bs. manillas; Stettin, 13 tons chemical fibre.

DOMESTIC RAGS.—Stocks are in fairly good shape, and there is a moderate business in progress, with quotations at 3¼c. for Whites, 2@2½c. for Soiled Whites and 1@1½c. for No. 2's.

BAGGING, &c.—There is very little call for Gunny Bagging nowadays, and yet small lots are going with the range of the general quotation 1.10@1.15c., 25 tons going at the outside figure. Other grades of jute stocks remain about as they have. Manilla imports for the week aggregated 841 bales, being 286 bs. from Copenhagen, 128 bs. from Dundee, 319 bs. from Hull and 108 bs. from Hamburg.

OLD PAPERS.—There is a steady run of small orders in the Old Paper market. We quote: No. 1 Hard White Shavings, 2½@2¾c.; No. 1 Soft White do., strictly free from wood, 2.15c.; Soft White do., ordinary, 1¾@2c.; Old Ledgers, 2c.; Solid Printed Books, 1¼c.; Mixed Shavings, No. 1, 1@1¼c.; Mixed Shavings, No. 2, ¾c.; Extra No. 1 Manillas, 90c.; No. 1 Manillas, ordinary, 75c.; No. 2 Manillas, 60c.; Light Book Stock, 60c.; Folded News, 35c.; Mixed Papers, 35c.; Commons, 25@30c.; Straw Clippings, 45c.; Binders' do., 45c.

STRAW.—There is a steady call for desirable grades of straw. We quote Long Rye at 50@60c.; Short Rye at 40@45c.; Wheat at 40c.; Oat at 40@45c.

ROSINS.—Pale grades are scarce and wanted, and offerings all round are light. We quote: Common to Good Strained, $1.50@1.57½; E, $1.75; F, $1.90@1.95; G, $2 07½@2.10; H, $2.25@2.30; I, $2.35; K, $2.60; M, $2.80; N, $3.05@3.10; W G, $3.20.

CHEMICALS.—The market for paper makers' chemicals has been quiet. Under date of September 21, Peter R. McQuie & Son speak as follows of the Liverpool market: "Chemicals have lately ruled very dull, and even the passing of the United States tariff bill, from which such great things were anticipated, has failed as yet to stimulate prices. So long as the supply is more than ample for the demand, we cannot look for much improvement; but apparently the competition among manufacturers is reducing values to such unprofitable figures (even to the best appointed works), that production must soon be decreased and naturally lead to some recovery in prices. Meanwhile it is a buyers' market, and forward contracts are worth consideration. With reference to the following quotations for chemicals, especially those in Bleaching Powder and Caustic Soda, we would point out that the prices are quite nominal, and may vary a long way from the figures stated, everything depending upon the country for which the goods are destined. We would also mention that we are constantly watching all articles affected by the late United States tariff bill, and will be glad to send out special and private advices whenever requested. We quote today: Bleaching Powder, £7 5s. to £7 15s. per ton; Caustic Soda, 60 per cent., £7 5s. to £7 15s.; 70 per cent., £8 5s. to £8 15s. per ton; 74 per cent., £9 5s. to £9 15s. per ton; Soda Ash, Leblanc quality, £3 10s. to £4 per ton; 58 per cent. Ammonia Alkali, £3 5s. per ton in bags, £3 10s. in casks; Chlorate of Potash, 6d. per pound, prompt; 5¾ to 5½d. for 1895. Soda crystals, £2 10s. per ton." Alkali is in somewhat better movement in the local market, and there has been more inquiry for forward shipments. Caustic Soda is quiet but steadier, with 2.15c. quoted for 70 per cent., and 2.20c. for 74 per cent. Sal Soda is in better movement, but Bleaching Powder is quiet. Spot stock continues very much restricted, and sales have been made at 1.82½@1¾c. During the week there have been sales 25 cks. Bleach at 1.82@1¾c.; 25 tons Soda Ash at 1¼c.; Caustic Soda 70 per cent., at 2.15c., and 74 per cent. at 2.20c.

CHINA CLAY.—We hear of several quite large sales of spot goods since our last writing, and business in this line shows a better appearance. Bulk quantities may be bought as low as $7.50 per ton.

TWINES.—There is a moderate business being done. We quote: Sisal Hay Rope, 5@6c.; Sisal Lath Yarn, fine, 9¼c., and medium, 9c.; Jute Lines, 7½c.; Jute Ready, 7@7½c.; New Zealand Hay Rope, 6¼@7¼c.; New Zealand Lath Yarn, fine, 9¼c.; medium, 8¼c. Twines—Hemp, 4½ and 6 B Russia, 12c.; 4½ and 6 A American, 12c.; 4½ and 6 D Jute, 9½c.; 4½ and 6 L Jute, 9c.; Hemp Ball, 18 B C, 17c.; 18 C, 15c., Russian Hemp Hay Rope, 9c.

COAL.—Bituminous business is fairly good, with tonnage large and prices low. The Massillon, Ohio, district is now turning out coal after many months of no work for the men and loss of trade to the operators. Shipments of soft coal through the Saulte Canal furnish evidence of the fact that there will be no lack of tonnage at Northwestern points, for there is every probability of last year's total being attained. All districts east of the Alleghenies are turning out fair supply and the seaboard market is quite easy.

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PRICES CURRENT.

NEW YORK MARKET.

Paper Market.

DEALERS' SELLING PRICES.

Ledger and Record	$0.18	@	$0.24
Flat Caps, superfines	14	@	16
Flat Caps, fines	11½	@	13
Flat Caps, engine sized	7½	@	9
Blotting, American	8	@	15
Blotting, English	17	@	....
Book, super sized and calendered	6	@	9
Book, super sized and tinted	6	@	7½
Book, extra machine finish	5½	@	6
Book, machine finish, low grade	5	@	5½
News, No. 1	4	@	4½
News, rag and wood	3	@	3½
Poster	5	@	7
Hanging, superfine, No. 1	8	@	10
Hanging, superfine, No. 2	6	@	8
Hanging, machine satin	4	@	4½
Hanging, white blank, No. 1	4	@	4½
Hanging, curtain	3½	@	4
Hanging, brown	2½	@	3
Colored papers, double mediums	6½	@	8
Colored papers, glazed medium	7½	@	8½
Colored papers, tobacco	8½	@	9½
Colored papers, tissues, 20×30, ℔ ream	1.10	@	1.35
Tissues, black, 20×30, ℔ ream	1.40	@	1.50
White tissue, 20×30, ℔ ream	85	@	1.00
White tissue, 24×36, ℔ ream	1.30	@	1.50
Manillas, Flour sack, cream	10½	@	....
Manillas, Flour sack, drab	9½	@	11
Manillas, Rope, unbleached No. 1	9½	@	11
Manillas, Rope, unbleached No. 2	7½	@	9
Manillas, No. 1, light weight	6½	@	6½
Manillas, No. 1, heavy weight	6½	@	6½
Manillas, No. 2	5	@	6
Manillas, Bogus	2½	@	3½
Wrapping Parchment	16	@	
Tissue Manillas, full count, weight and size, 24×36, other sizes in proportion	75	@	80
Hardware, light colored, No. 1	9	@	10
Hardware, No. 1, glazed, tarred	7	@	8
Hardware, No. 1, glazed	4½	@	5
Binders' Boards, ℔ ton, No. 1	70.00	@	90.00
Binders' Boards, ℔ ton, No. 2	40.00	@	50.00
Strawboards, air dried, No. 1, ℔ ton	47.50	@	....
Strawboards, steam dried, No. 1, ℔ ton f. o. b. mill	....	@	24.00
Straw Wrapping, basis, 15×20, 15½ lbs., 20 sheets—			
36×40, from 38 to 42 lbs. ℔ rm	85	@	....
30×40, from 30 to 34 lbs. ℔ rm	....	@	72
24×36, from 24 to 26 lbs. ℔ rm	....	@	60
22×32, from 24 to 26 lbs. ℔ rm	56	@	....
20×30, 21 lbs., ℔ rm	....	@	44
20×30, from 14 to 17 lbs. ℔ rm	36	@	....
16×22, from 12 to 13 lbs. ℔ rm	28	@	....
18×28	....	@	32
15×20, 10 lbs. ℔ rm	17	@	19
15×20, from 7 to 8½ lbs. ℔ rm	17	@	19
14×18	....	@	15
12×16	....	@	13
11×15	....	@	11
Straw Wrapping, ℔ lb., heavy weight	1.75	@	1.85
Straw Wrapping, ℔ lb., light weight	1¼	@	....
Cigarette, Straw Tissue, per case of 100 boxes, 50 books to the box, 200 sheets to the book	21.00	@	30.00
Tea Papers, 16 sheet quires—			
12x18	18	@	20
14x20	22	@	....
Card Middles, ground wood	5½	@	6¼
Card Middles, long fibre wood	8½	@	9
Card Middles, rag and wood	8	@	9
Pulp Lined Boards, single manilla, No. 100 and heavier	42.50	@	....
Pulp Lined Boards, double manilla, No. 100 and heavier	47.50	@	....

Chemicals, Coloring Materials, &c.

Alkali, 58 ℔ cent	1	@	1.20
Alum, lump	1.65	@	....
Alum, ground	1.75	@	....
Alum, Keystone	1¾	@	2
Alum, Diamond	....	@	2½
Alum, pearl	2¾	@	2¾
Alum, porous	2¾	@	2¾
Alum, Merrimac porous	2	@	....
Aluminous Cake	....	@	1¼
Anti-Chlorine	....	@	2½
Bichromate Potash, American	....	@	10
Bleaching Powders, spot	....	@	1¾
Cambridge Ochre	11.25	@	....
Caustic Soda, 60 ℔ cent	2.30	@	2.30
Clay, China, English, ℔ ton	12.50	@	17.00
Clay, China, "Star"	12.50	@	....
Clay, China, "Keystone"	10.75	@	....
Clay, South Carolina, ℔ ton	9.50	@	10.00
Clay, Terra Alba, French, ℔ cwt	1.00	@	1.12½
Clay, Terra Alba, American, No. 1	95	@	1.00
Corn Starch	3	@	3½
Copperas, American	....	@	80
Extract Logwood	9½	@	....
Mineral Pulp	10.25	@	....
Orange Mineral	....	@	9½
Potato Starch	4½	@	4¾
Prussian Blue, dry	30	@	35
Prussiate Potash, American	....	@	34½
Rosins, common to good strained, ℔ bbl	1.50	@	1.55
Rosins, E, ℔ bbl	1.75	@	....
Rosins, F, ℔ bbl	1.80	@	1.95
Rosins, G, ℔ bbl	2.07½	@	2.10
Rosins, H, ℔ bbl	2.25	@	2.30
Rosins, I, ℔ bbl	2.35	@	....
Rosins, K, ℔ bbl	2.60	@	....
Rosins, M, ℔ bbl	2.80	@	....
Rosins, N, ℔ bbl	3.05	@	3.10
Rosins, W G, ℔ bbl	....	@	3.20
Sal Soda	1.10	@	....
Soda Ash Caustic, 48 ℔ cent	1.60	@	1.65
Soda Ash, carbonated, 48 ℔ cent	1.57½	@	1.70
Soluble Blue	40	@	55
Spanish Brown	½	@	1
Sugar Lead, white	12	@	....
Sugar Lead, brown	7	@	....
Sulphate of Alumina	....	@	2½
Sulphuric Acid, 66 ℔ cent	1	@	1¾
Ultramarine, blue	14	@	17½
Venetian Red	1	@	1½
Vitriol, blue	5½	@	5¾
Yellow Ochre Rochelle	1.35	@	1.50

BOSTON MARKET.

Paper Stock.

White Rags, No. 1	3½	@	3¾
No. 2 Whites	2	@	2½
Common Seconds	1½	@	2
Thirds and Blues	1	@	1.10
Southern Mixed Rags	80	@	1
Colors, country	¾	@	¾
Colors, city	25	@	30
New Calicoes, light	2	@	2½
New Calicoes, dark	1½	@	1¾
Shirt Cuttings, best	4	@	4½
Shirt Cuttings, good	3½	@	4
Shirt Cuttings, unbleached	3½	@	3¾
Shirt Cuttings, unbleached No. 2	2½	@	3
Shirt Cuttings, cheviots	2½	@	2¾
Overall Cuttings, blue	2½	@	3
Overall Cuttings, brown	2	@	2½
Shoe Rags, bleached	3½	@	3¾
Shoe Rags, unbleached	3½	@	3¾
Shoe Rags, brown	3	@	3½
Cotton Flannels, bleached	3½	@	4
Cotton Flannels, unbleached	3½	@	3½
Corset Rags, drab	3½	@	3½
Corset Rags, white	4	@	4½
Tailors' Seconds	1¾	@	1¾
Tailors' Colors	25	@	30
Cotton Canvas	3	@	3½
Cotton Canvas, No. 2	1¾	@	1¾
Linen Canvas	1½	@	2
New Canvas Cutting	4	@	4½
Insole Canvas	3	@	3½
Print Papers, best	25	@	30
Print Papers, ordinary	....	@	....
Folded News	25	@	30
Old Waste Papers	30	@	35
Manilla Paper, No. 1	1.15	@	1.25
Manilla Paper, good mixed	85	@	90
Manilla Paper, blues	65	@	75
Mixed Book Stock	25	@	1
Books and Pamphlets	1	@	1½
Book Stock, light	70	@	75
Ledgers and Letters	1.90	@	2
Soft Book Shavings	1¾	@	2
Hard White Book Shavings	2¼	@	2½
Leather Board Chips	75	@	85
Straw Chips	35	@	40
Shivey Bagging	1½	@	....
No. 1 Factory Bagging	¾	@	1
Burlap Bagging	1.00	@	1.05
Burlap Bagging, large pieces	....	@	2
Kentucky Bagging	....	@	....
Mixed Bagging	¾	@	¾
No. 2 Bagging	½	@	¾
Shakings, soft	½	@	....
Tarred Shakings	1	@	1¼
Standing Rigging	2½	@	2¾
Standing Rigging, foreign	2¾	@	....
Bolt Rope	2	@	2.10
Oakum Junk, No. 2	1¼	@	1½
Tarred Paper Junk	1.15	@	1.20
Tarred Paper Junk, inferior	¾	@	....
Manilla Rope	1¾	@	2
Tarred Manilla	1½	@	....
Hemp Strings	1¾	@	2
Sisal Strings	....	@	1.10
Wool Strings	90	@	1.00
Flax Tow	½	@	1
Flax Waste	¾	@	1

Chemicals.

Alkali	90	@	1
Aluminous Cake, currency	1¼	@	1½
Alum, American ground	....	@	1.95
Alum, American lump	....	@	1.85
Anti-Chlorine	2	@	2½
Bichromate Potash	9	@	9½
Bleaching Powders	1¾	@	2
Caustic Soda, 74 ℔ cent	....	@	2.65
Clay, English, ℔ ton	14.00	@	18.00
Clay, American, ℔ ton	10.00	@	11.00
Copperas, ℔ lb	65	@	75
Extract Logwood	5½	@	10½
Lime, Rockland, ℔ bbl	85	@	90
Prussian Blue, ℔ lb	32	@	35
Prussiate Potash, yellow	24½	@	25
Prussiate Potash, red	38	@	38½
Rosin, common strained, ℔ bbl	1.90	@	2.50
Rosin, Medium	2.20	@	3.00
Rosin, extra pale, ℔ bbl	3.60	@	4.50
Sal Soda, ℔ lb	....	@	75
Soda Ash, 48 ℔ cent. caustic	1.40	@	1.60
Soda Ash, 48 ℔ cent. carbonated	1.37	@	1.50
Soluble Blue	2.50	@	3.50
Sugar Lead, white	8½	@	....
Sugar Lead, brown	5½	@	5½
Sulphuric Acid, 60°	¾	@	1¼
Terra Alba, ℔ ton	9.00	@	15.00
Ultramarine, ℔ lb	7	@	25
Venetian Red, ℔ lb	70	@	2½
Vitriol, Blue	3½	@	3½
Yellow Ochre	½	@	1

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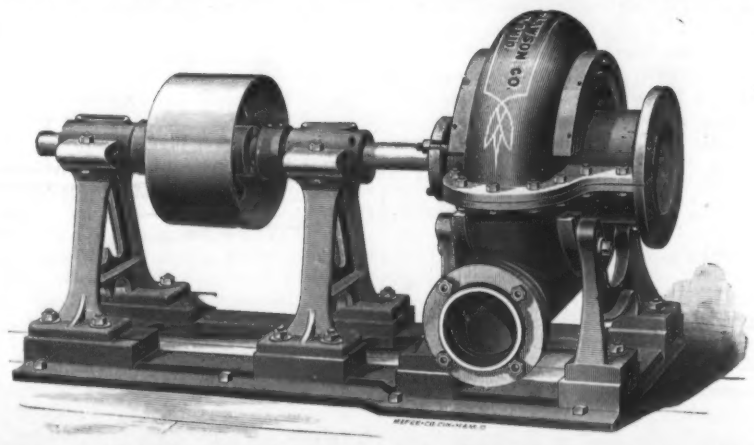

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NOTICE.

My attention having been called to the fact that certain parties are infringing certain Letters Patent granted to me, to wit: No. 212,866, dated March 4, 1879, covering a new form of carpet lining, and No. 265,698, dated December 21, 1880, covering the method of and apparatus for making the same, this is to notify all such persons, whether manufacturers or dealers, that any infringement of either of said patents will be prosecuted to the full extent of the law. MOSES NEWTON, Patentee.

PAPER MILL MACHINERY.

One 84 inch Fourdrinier part to paper machine complete, with Gould screen.
One 74 inch Fourdrinier machine complete, Gould screen; gun metal press rolls, 15x75 inches; eight iron dryers, 36x72 inches; stack of nine chilled rolls, 72 inch face; upright reel and cone pulley cutter; Bess slitters.
One Gould screen, eight plates, 10x26 inches.
One Gould screen, eight plates, 12x40 inches.
One Barber's suction.
One 70 inch machine complete, Gould screen, Fourdrinier wire, 70x33 inches; first and second presses; eight iron dryers, 36x65¾ inches; stack five chilled rolls, four 12 inches, one 16x64 inches face; upright reel, slitter and winder.
Two new 1,000 pound Holyoke Machine Co. beaters, wood tubs.
One 1,000 pound iron tub beater.
Six beating engines, 36 inch roll, iron tubs.
One 1,200 pound Horne patent engine, new.
One rotary, 7x20, double riveted, 9-16 inch shell.
Three Sewall & Roberts hydraulic pulp grinders.
Three Jordan engines.
Two rag cutters and duster.
Four iron dryers, 28x72 inches.
Send for catalogue of machinery, steam engines and boilers.
1,000 feet shafting, 2 to 6 inches diameter; 500 feet belting, 5 to 48 inches wide.
Parties wanting tools, stock or machinery used in a paper or pulp mill can find it here at a bargain.
F. H. DAVIS & CO., Exchange B'd'g, Boston, Mass.

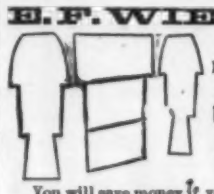
—THE—
Cedar Point Foundry,
PORT HENRY, N. Y.

WOOD PULP GRINDERS,
WET MACHINES,
Jeffers Suction Screen.

Made in three sizes: Eight, Nine and Ten Plates.

☞ SEND FOR BLUE PRINTS.

E. F. WIECKERT



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MANUFACTURER OF
COGS
AND ALL KINDS OF
MILL WORK.

You will save money if you have no cog pattern by drawing a cog out of a wheel, marking the exact width on the face cut and the exact thickness on the end cuts of this diagram and sending to me. If you want one key seat only, mark off one when you send card for pattern. I carry a complete stock of seasoned Hard Maple and can make Cogs on short notice. When you write for price give width and thickness of larger end. Write for pattern cards.

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Bowsher's SPEED or MOTION INDICATOR
IS INDISPENSABLE
In obtaining a UNIFORM speed of machinery, and is one of the most PROFITABLE little devices ever put in a mill. Will pay for itself in 30 days. Dial 12 in. in diameter. Weight 10 pounds.
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PROVIDENCE STATIONERY CO.

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Paper and Twine,

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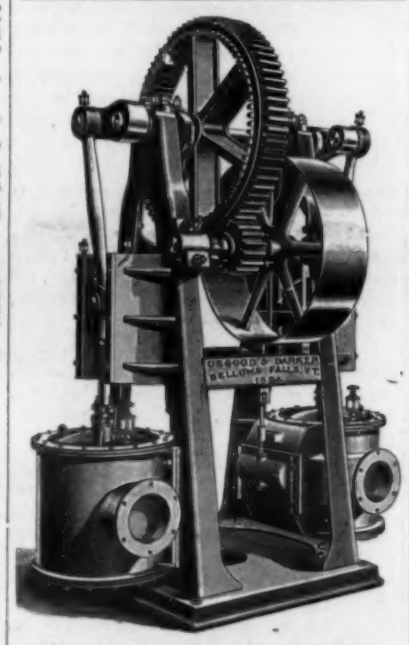

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Weight, Four Tons.

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Sulphur Burners,
Acid Pumps,
Barkers,
Chippers,
FOR SULPHITE PLANTS.
Fourdrinier and Cylinder Paper Machines,
With one, two, three or four stacks of dryers.
Upright Reels, with two or three Drums,
Reel Stacks and Revolving Reels,
Rewinding and Slitting Machines,
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For buffing ends of the rolls.
Ground Wood Pulp Machines,
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Pulp and Paper Machinery
For all kinds of Paper.

WRITE FOR DESCRIPTIONS AND PRICES.

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Revolving Paper Cutters,
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Chilled Iron Calenders,
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DO YOU WANT A . .

RAG CUTTER,

TO CUT ROPE, JUTE BUTTS, BAGGING, OR ROOFING PAPER STOCK?

IF SO, WRITE TO

TAYLOR, STILES & CO.,

RIEGELSVILLE, N. J.

WATER POWER PLANT IN RICHMOND, VA., ON JAMES RIVER, ADMIRABLY LOCATED FOR PAPER MANUFACTURING.

60,000 SQUARE FEET FLOOR SPACE.

Mostly of latest fireproof construction and lowest insurance rate. Ample pump and hydrant service with Grinnell Sprinklers throughout. Power cheap and wheels in place. The above plant for sale. Adjoining property now occupied by a paper mill. Particulars with photographs and ground plans of buildings from

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RIVERSIDE PAPER CO., HOLYOKE, MASS. — "MAGNA CHARTA" BOND, "PURE LINEN STOCK" LINENS (WHITE WOVE AND CREAM LAID), "DUNDEE RECORD" LEDGERS.

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JENKINS BROS. VALVES

Have the Keyed Stuffing Box and Disk Removing Locknut.
NONE GENUINE unless they bear our TRADE MARK.
Cost no more than the Imitations. Send for Prices and Discounts.

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MANUFACTURER OF
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Especially adapted to resist the action of SULPHITE SOLUTIONS in PULP MACHINERY.

COMPOSITION SHELLS A SPECIALTY. | Phosphor Bronze, Brass, Babbitt Metals.

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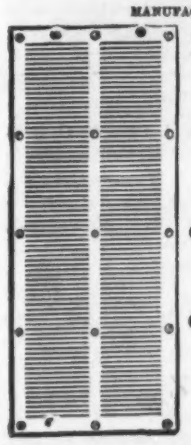

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—OF—

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—OR—

CAST METAL.

REPAIRING

OLD SCREEN PLATES

A SPECIALTY.

OLD AND NEW WORK.

CENTRAL SCREEN PLATE WORKS,

Niagara Falls, N. Y.

ESTABLISHED 1894.

Branch of the

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ESTABLISHED 1878.

METAL SKYLIGHTS

Absolutely no leakage from any source; no dripping or sweating; fire-proof; ventilating.

THE CLOVER LEAF

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FOR MILLS, FACTORIES AND DYE HOUSES.

Made of galvanized iron or copper. Strong upward draft; exhausts foul air, odors, gases, steam, etc. Perfectly storm-proof. Send for illustrated circular.

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THE MORRISON & HERRON TESTING SYSTEM.

THE MORRISON & HERRON IMPROVED PAPER TESTING MACHINES.

Three Different Machines

—FOR—

Strength, Thickness and Weight.

A NEW PRINCIPLE APPLIED IN TESTING PAPER.

Thickness shown to the sixteen-thousandth part of an inch.

Used in the GOVERNMENT PRINTING OFFICE and the DEPARTMENTS at Washington.

Price, complete,	$150.00
Or Strength Indicator,	75.00
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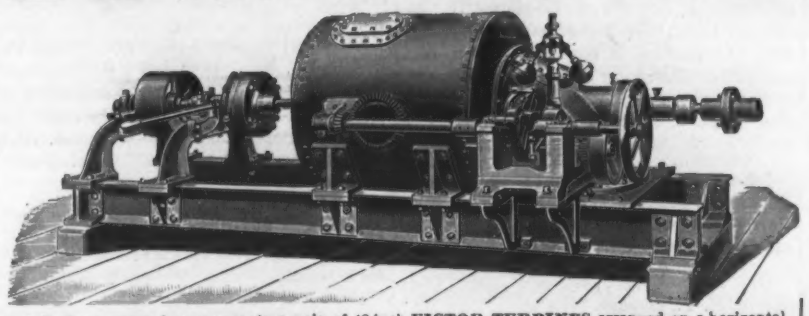
CAUTION.

All persons are liable to prosecution who make buy or use Paper Testers that confine and break paper within its edges, as my Patents cover that method.

THE VICTOR TURBINE.

UPRIGHT or HORIZONTAL.

In use in a large number of best Paper and Pulp Mills in this and other Countries.



THE above engraving represents a pair of 42 inch VICTOR TURBINES arranged on a horizontal shaft, with Cast Iron Flume, Draft Tubes, End Bearings for Shaft, and Driving Pulleys complete, all mounted upon a substantial cast iron bed plate. The entire arrangement is very complete and strictly first class in every particular. We are now prepared to furnish Victor Turbines, either single or in pairs, on horizontal shafts, and where the situation admits of their use we recommend them.

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SIZE WHEEL.	HEAD IN FEET.	HORSE POWER.	PER CENT. OF USEFUL EFFECT
15 inch	18.06	30.17	.8932
17½ inch	17.96	36.35	.9030
20 inch	18.21	45.00	.8582
25 inch	17.90	68.62	.8584
30 inch	11.65	82.54	.8676
35 inch	17.29	133.19	.8497
40 inch	16.49	148.98	.8253
48 inch	15.51	179.29	.8202

CYLINDER OR REGISTER ***GATE.***

INSURING HIGHEST PERCENTAGE OF USEFUL EFFECT AT

FULL AND PARTIAL GATE.

Such results, together with its nicely working gate and simple, strong and durable construction, should favorably commend it to the attention of all discriminating purchasers.

THESE WHEELS ARE OF VERY SUPERIOR WORKMANSHIP AND FINISH.

THE VICTOR WHEEL is particularly adapted to setting on **HORIZONTAL SHAFT,** DISPENSING ENTIRELY WITH GEARS.

STATE YOUR REQUIREMENTS AND SEND FOR CATALOGUE TO

THE STILWELL-BIERCE & SMITH-VAILE CO., DAYTON, OHIO, U. S. A.

ANNANDALE

Screen Plate Co.,

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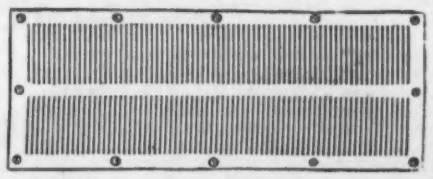

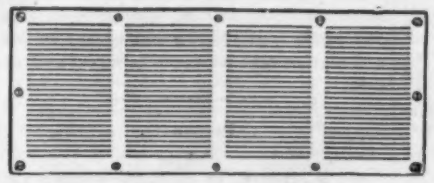

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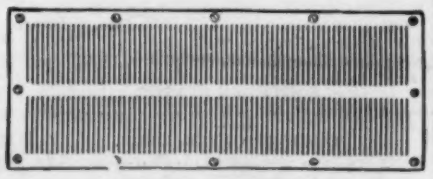

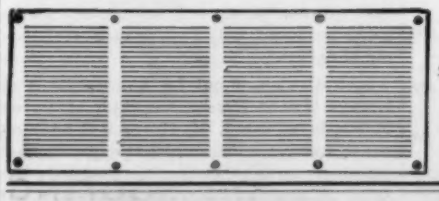

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AT PRICES

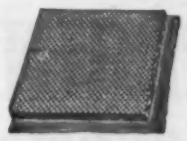
THAT CANNOT BE SURPASSED.

BEST STOCK USED.

Write for Prices and Gauges.

All Work Warranted.

SAMPLES AND QUOTATIONS FURNISHED UPON APPLICATION.



IMPERIAL ASBESTOS SECTIONAL PIPE

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Asbestos Prepared Roofings.

(Specially adapted to Paper Mills).

Chicago, Ill. **H. F. WATSON COMPANY,** Erie, Pa.

THE PAPER COMMISSION CO.,

Straw and Rag Wrapping Paper.

1775-1780 Old Colony Building, Chicago.

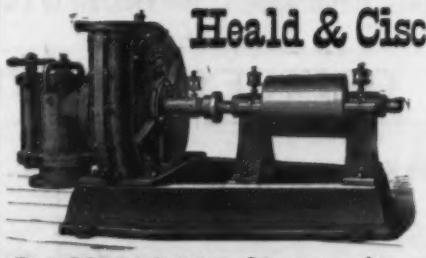
PERFORATED METALS

FOR

PAPER MILLS.

THE OLD RELIABLE

Heald & Cisco Centrifugal Pump.



MORE OF THEM USED BY PAPER MAKERS THAN OF ALL OTHER KINDS COMBINED.

More than EIGHTEEN Thousand in Use.

CAUTION!—Other pump makers are advertising their wares as the "Baldwinsville" Centrifugal Pump. This claim is fraudulent and intended to deceive. We are the only manufacturers of Centrifugal Pumps in Baldwinsville, and we warn all purchasers against parties falsely claiming otherwise.

MORRIS MACHINE WORKS (formerly Heald & Morris), Baldwinsville, N. Y., U. S. A.

HENION & HUBBELL, Agents, 55 and 57 North Clinton Street, Chicago, Ill.

ESTABLISHED 1848.

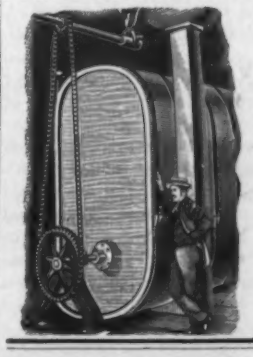
JOHN WALDRON, NEW BRUNSWICK, N. J.,

MANUFACTURER OF ALL STYLES OF

COATING MACHINERY FOR LITHOGRAPH, LABEL, FANCY, GLAZED, BOOK AND SAND PAPERS.

Also Cardboard and Paper Hangings Machinery. Hilbers, Stalb and Waldron Patent Hanging Up Machines. Patent Power Reeling Machines for Coated Papers and Cardboard. Embossing Machines, Paper Rolls, Polishing Machines, &c.

Machinery is universally used by the manufacturers of above goods in the United States and Canada.



THE SAVAGE PERFECTING STUFF CHEST.

Fits into a narrow space and requires but little power to operate.

It has a double agitating motion, moving the stuff in different directions, which prevents "floating."

It empties itself clean; no waste of stuff and protects from dirt.

Quantity of stuff in chest always shown by indicator.

In writing give space in height, length and breadth if pressed for room; also the amount of stock in dry paper that the chest is wanted to hold.

PATENTED AND MANUFACTURED BY

E. L. SAVAGE, Mechanic Falls, Me.

FOSTER & BROWN, SACCARAPPA, MAINE.

MACHINISTS AND IRON FOUNDERS.

SPECIALTIES:

Improved Paper-Coating Machines; Hanging Machines and Power Reels for Coated Paper; the Merrill-Foster Noiseless Pulp Screens; Paper Slitting and Trimming Machines; Hardened and Ground Slitters; Automatic Elevators.

BUILT UNDER OUR OWN SUPERVISION.

THE "WANDEL" Patent Rotary STRAINER

Is the best Screen on the market, and is now used in

148 Paper Mills in Germany.
25 Paper Mills in Austria.
85 Paper Mills in France.
12 Paper Mills in Switzerland.
31 Paper Mills in Italy.
16 Paper Mills in Spain.
26 Paper Mills in England.
9 Paper Mills in Sweden and Norway.
10 Paper Mills in Russia.
And in the Thilmany Pulp and Paper Mills, Kaukauna, Wis.

The "Wandel" Patent Rotary Strainer is delivered ready for use, with or without the bearing frame.

FOR FURTHER PARTICULARS APPLY TO

CHR. WANDEL, Reutlingen, Germany.

Or GEORGE HAMILTON, 74 Wall St., New York.

CYRUS CURRIER & SONS,

NEWARK, N. J.,

Paper Machinery.

KINGSLAND

BEATING ENGINE.

IMPROVED MACHINES

FOR MAKING

SQUARE PAPER BAGS.

By our PATENT methods of obtaining slack paper, severing bag lengths and applying paste, we are enabled to make perfect bags at a speed not attained by any other machine on the market. For full information and prices address

The Diamond Paper Bag Co.,

WILMINGTON, DEL., U. S. A.

NOW READY!

THE TWENTIETH EDITION

—OF—

LOCKWOOD'S DIRECTORY

—OF THE—

Paper, Stationery and Allied Trades

1894-5.

Price, Two Dollars a Copy,

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THIS pioneer and standard book, now in the twentieth year of its publication, enjoys the confidence of every person in the trades which it represents. It is carefully and thoroughly compiled and edited each year. After one edition has been printed the type is distributed, and when a new edition is undertaken the data, item by item, are obtained and put into type especially for it, thus making the work reliable. Altogether about 475 pages set forth facts which must be invaluable to all engaged in the making and selling of Paper and Stationery, as well as all others in the allied branches of the trades.

It enables manufacturers, buyers and sellers to come together for mutual benefit.

The book includes a list of Paper Makers in the United States, Canada and Mexico; Wholesale and Retail Stationers, Paper Dealers; Leading Printers, Lithographers, Book Publishers, Bookbinders, Wall Paper Printers; Blank Book, Paper Bag, Paper Box, Envelope, Pad and Tablet Manufacturers; Railroad Buyers, &c., in the United States.

Orders filled according to date of receipt. Address

HOWARD LOCKWOOD & CO.,

126 & 128 Duane St., New York.

Manufacturing News.

EASTERN STATES.

F. D. Smith and others will engage in the manufacture of glazed papers in a new factory now in course of construction on Crescent street, Holyoke, Mass.

F. C. White, paper box manufacturer, Newburyport, Me., will enlarge his plant, increasing its capacity.

MIDDLE STATES.

The Niagara Falls Paper Company, Niagara Falls, N. Y., has put in a Marshall perfecting engine.

The York Card and Paper Company, York, Pa., is working day and night shifts, with two sets of employees.

The paper mill at Sidney, N. Y., has resumed operations.

The Wendler Machine Company, Carthage, N. Y., lately perfected a new machine for reducing the chips in sulphite and soda mills to a uniform size. This machine will supply a long felt want among the manufacturers of pulp. Every fibre maker has recognized the fact that uniform chips meant uniform cooks, but just how to reduce the chips to the desired state was a question hard to solve. This new chip crusher, as the Wendler Machine Company calls its new machine, is very simple; but it performs the work required perfectly, little power being used. It consists of a heavy iron case in which are two disks, one stationary and the other revolving at about 600 revolutions per minute. To the face of each disk are fastened at regular intervals heavy steel pins. The chips are conveyed directly from the chipper to the machine and pass between the disks, the swiftly revolving pins breaking up the knots and larger chips, the smaller ones being undisturbed, and discharges them at the bottom. It is claimed that by the use of this machine there is a larger yield per cord of wood, as a weaker solution of acid or alkali can be used to cook with, a uniform length of fibre being the result. It is thought that this machine is destined to become one of the most important factors in the manufacture of fibre.

The Friction Pulley and Machine Works, Sandy Hill, N. Y., are doing a great business in suction screens. They have just shipped their third order of five "Success" screens to the Otis Falls Pulp Company, Livermore Falls, Me., making a total of twenty-four which they have shipped to this concern within a year. They also recently shipped the third order to the Beebe & Holbrook Company, Holyoke; a second order to the Kimberly & Clark Company, Kimberly, Wis.; a fourth to Wilkinson Brothers & Co., Shelton, Conn.; a second to the Uncas Paper Company, Norwich, Conn., and are making the second order for the Shattuck & Babcock Company, De Pere, Wis. This speaks well for the "Success" screen, the great feature of which, the manufacturers claim, is that it works perfectly on any and all kinds of stock.

The Montgomery Paper Mill, Montgomery, N. Y., is reported to have shut down for want of orders.

The Rock City Paper Company has taken possession of the Big Falls Mills, at Rock City Falls, N. Y. This mill was bought by the company from Chauncey Kilmer.

Moyer & Palen, Greig, N. Y., are enlarging their paper mill and making extensive repairs therein.

WESTERN STATES.

The Badger Paper Company is pushing work on its big new pulp mill at Little Quinnesec Falls, Wis.

The American Straw Board Company, Lockport, Ill., has put in two large sized Marshall perfecting engines.

The mill of the Puget Sound Pulp and Paper Company was shut down for one week lately to make repairs. It has again started up.

The mill of the American Straw Board Company at Kokomo, Ind., which has been shut down for a year, is waiting for an increase in the water supply, when it will be started up.

It is reported that a paper bag factory is likely to be established at Battle Creek, Mich.

The Harding Paper Company, Franklin, Ohio, has put in a Marshall refining engine.

SOUTHERN STATES.

It is reported that yet another paper mill is to be built at Marietta, Ga.

Wellhouse & Son, manufacturers of paper bags, Atlanta, Ga., have purchased a site on which they will erect a six story factory, 105x140 feet, to cost $18,000, in order to meet the increasing demand upon their business.

CANADA.

It is reported that the Canadian "Soo" water power has been sold to a Philadelphia syndicate. The new management will at once begin work on improvements, which before they are completed will call for an expenditure of $1,000,000. These improvements will include the further development of the canal to 13,000 horse power, the putting up of a new and better system of electric lights, with an increase of fifty arc and 150 incandescent lights for the town; the establishment of a water works system, with 4 miles of mains and fifty hydrants, for which the town will pay the new company $10,000 a year, and the construction of a pulp and paper plant, embracing four mills. This pulp and paper plant will be one of the largest and best on the continent. The water power canal at the Canadian Soo was projected several years ago by private individuals. After a partial construction of the canal its promoters were prevented by lack of funds from completing it. The corporation of the town of Sault Ste. Marie, Ont., came to the rescue of the project, on which its hopes for the future greatly depended. By special legislation the town was given authority as a corporate body to obtain control of and finish the canal. After much delay and difficulty an issue of bonds to obtain money to complete the enterprise was sold. The work was prosecuted under more or less difficulty. Although often discouraged, the town kept right on until the canal was finished last fall. It was a heavy burden and the citizens welcomed the opportunity which enabled them to transfer the enterprise to a company with ample capital to fully develop the canal, build mills and make a great manufacturing point. The new stockholders assume all of the liabilities of the town, and pay the town $260,000 for its $251,000 of stock in the Ontario and Sault Ste. Marie Water, Light and Power Company. In return the town is to exempt the company from taxation for ten years, and enter into a contract with the company for the water works and electric light systems.

Obituary.

OLIVER WENDELL HOLMES.

Dr. Oliver Wendell Holmes, the distinguished poet, literator and scientist, died at his home in Boston on Monday, October 8, at the advanced age of eighty-five. Although he had been in feeble health for some time, and for a few days before death had suffered an aggravation of an asthmatic complaint from a severe cold, the summons came swiftly and unexpectedly.

Dr. Holmes was born in 1809. Entering Harvard in 1825, he graduated in 1829. He then took up the study of medicine, spending a year in Paris perfecting his studies, and after a period of travel, delightfully recorded in his volume of "Impressions Abroad," returned to America and seriously entered upon his chosen life work. In 1838 he was elected professor of anatomy and physiology at Dartmouth College, and in 1847 was appointed to a professorship in the medical department of Harvard College, which he held for thirty-six years, never missing a lecture in all that time.

It was in the field of literature, however, that Dr. Holmes was most widely known and affectionately regarded. As one of the splendid galaxy of New England stars—Lowell, Longfellow, Whittier and others—to whom our country is so largely indebted for her equal position with other nations in the universal republic of letters, Dr. Holmes held easily the place of loving regard in the hearts of his fellow countrymen.

RICHARD WORTHINGTON.

Richard Worthington, who for very many years had been identified with the book publishing trade of this city, died suddenly on Sunday night at his home at Sea Cliff, L. I. He appeared to be in his usual health on Sunday, and attended church in the evening. About 11 o'clock he complained of a suffocating sensation. A doctor was called, but before he arrived Mr. Worthington was dead.

Richard Worthington was born in Preston, Lancashire, England, in 1834, and came to this country in 1853, beginning a small book publishing business in Montreal two years later. In 1869 this business was transferred to Boston, and from there he came to this city. In 1885 he was forced to make an assignment, but immediately afterward organized the Worthington Publishing Company, making his wife Margaret president of the new company, while he became secretary and general manager. Mrs. Elizabeth Sproule was made the treasurer of the new concern, which had a capital stock of $20,000.

The Worthington Publishing Company failed in January, 1893, with liabilities placed at $130,000. Thus far none of the creditors have received any dividends. Mr. Worthington leaves a widow, but no children, and a brother in England. The intimation that he had committed suicide is denounced as untrue.

Lucius A. Chase, at one time a member of the Boston book firm of Brown, Taggart & Chase, and for many years in charge of the publishing house of Orange Judd & Co., died on Wednesday evening, October 3, at Newton, Mass., at the age of seventy-four years.

J. M. Davidson, editor of the Carthage (Ill.) *Republican*, died at Lewiston, Ill., on Sunday night, September 30, aged sixty-six. He founded a paper at Canton, Ill.; the *Fulton Democrat* at Lewiston, Ill., and the *Squatter Sovereign* at Havana, Ill. He owned and edited the *Carthage Republican* for thirty-five years.

John K. Terrill, a member of the Graham Paper Company, St. Louis, Mo., died at Portland, Ore., on October 6, from rheumatism of the heart.

Geo. N. Tackabury, maker of maps, Canastota, N. Y., is dead.

F. W. Truesdale, of Truesdale & Murray, publishers, Titusville, Pa., is dead.

Mortgages, Etc.

[In the appended list R. signifies a renewal of a pre-existing mortgage; B. S., bill of sale; T. D., trust deed, and Real, a mortgage on real estate.]

MIDDLE STATES.

Mortgagor.	*Amount.*
G. B. Spearin, Bayonne, N. J.	$2,000
John Vetterlein, Plainfield, N. J. (B. S.)	—
L. W. Miller & Co., Rochester, N. Y.	100
Arthur F. Ferriss, Utica, N. Y. (B. S.)	1

WESTERN STATES.

C. B. Hornby, Chicago, Ill.	200
Cline & Wallingby, Boone, Ia.	800
S. W. Holcomb, Boone, Ia. (B. S.)	800
George C. Weber, Vinton, Ia.	550
Wm. & Adam Breed, Hastings, Neb.	286
C. H. Swallow, Leigh, Neb.	187
Fassett Mickle Printing Company, Lincoln, Neb	100
Lincoln *Weekly Herald*, Lincoln, Neb.	350
Will L. Scism, Omaha, Neb.	500
Lewis Voight (Lewis Voight & Sons Company), Cincinnati, Ohio (Real)	5,000
R. D. Freeborn (Freeborn & Co.), Portland, Ore. (Real)	1,500
J. R. McIntyre, Tacoma, Wash. (B. S.)	1
Neuman-Kasimer (et ux.), Milwaukee, Wis.	200

SOUTHERN STATES.

Fox & Barton, St. Louis, Mo.	1,300

DISTRICT OF COLUMBIA.

Ferry Brothers, Washington (T. D.)	2,000

CANADA.

J. S. Boyd (H. T. Stevens & Co.), Moncton, N. B. (B. S.)	200
J. S. Boyd (H. T. Stevens & Co.), Moncton, N. B. (B. S.)	80
Henry McKnight, Spring Hill, N. S. (B. S.)	350

LIENS DISCHARGED.

Chas. L. Hilbourn, Muskegon, Mich.	318
Lewis Voight (Lewis Voight & Sons Company), Cincinnati, Ohio (Real)	4,725

Fires.

E. E. Thompson & Co., dealers in wall paper, &c., Waco, Tex., have been damaged by fire.

T. Newton Kurtz & Son, stationers, Baltimore, Md., have been damaged by fire; insured.

The wet-machine room of the Appleton Pulp and Paper Company, Appleton, Wis., was burned on October 6. Loss, $3,000; insured.

The mill of the Olive Manufacturing Company, West Shokan, N. Y., has been damaged by fire. This mill is run on wood pulp for dynamite.

Accidents.

George Fish, an employee of the Ticonderoga Pulp and Paper Company, Ticonderoga, N. Y., was badly hurt recently while hoisting bundles of pulp. A heavy pulley gave way, and falling on him, broke one of his legs and injured him internally.

George C. Miller, aged thirty-seven, and proprietor of the paper mill at Averill Park, N. Y., was killed on October 2 at Troy, N. Y. He was driving a team of horses, which became frightened, and running away, collided with an electric light pole. Mr. Miller was thrown out of the wagon, and was caught between its wheel and the pole.

Personals.

W. F. Dodge, of E. Butterworth & Co., Manchester, England, arrived here last Saturday on the Etruria.

F. F. Raymond, formerly with the Bacon Paper Company, has formed a connection with the Glen Manufacturing Company.

Jean Freeze, of Perkins, Goodwin & Co., who has been laid up for several weeks with an attack of sickness, is again at business.

A. E. Osborn, of Osborn & Wilson, has just returned from a Western trip with a smile produced only by a very liberal supply of orders.

Invitations are out for the wedding of Lorena Maude Horne, daughter of Byron F. Horne, of the J. H. Horne & Sons Company, Lawrence, Mass., to George Bryand Burnham, on October 17. Bon voyage! "At home" November 7 and 21, at 72 Abbot street, Lawrence, Mass.

S. Webber Parker, who was formerly engaged in the paper stock importing trade, has been elected treasurer of the new Casino Company, which is to run the New York Casino as a first-class music hall.

In Town.

Charles E. Price, Minsi, Pa.; W. O. Russell, Lawrence, Mass.; C. H. Mullen, Mount Holly Springs, Pa.; S. S. Stevens and F. L. Stevens, North Hoosick, N. Y.; H. M. Knowles, Boston, Mass.; E. C. Southworth, South Hadley Falls, Mass.; H. E. Pratt and E. W. McClintock, Springfield, Mass.; W. S. Royce, Fulton, N. Y.; W. H. Eaton and Walter Smith, Lee, Mass.; F. D. Howland, Sandy Hill, N. Y.; W. H. Claflin, Boston, Mass.; D. W. Mabie, Ballston, N. Y.

General Notes.

The Wilson Dry Goods Company, Wichita, Kan., which had a stationery department in its business, is reported as having gone into the hands of a receiver.

The order appointing a receiver for the Stanley-Bradley Publishing Company, New York city, which was based on a disputed judgment for taxes, has been vacated, the judgment having been satisfied.

On October 8 Justice Cullen, of the Supreme Court, appointed David Barnett referee to take testimony for a voluntary dissolution of the Bellport Lace and Fancy Paper Company, Bellport, N. Y. The company is capitalized at $15,000.

During the week beginning October 15 the Crocker Manufacturing Campany, Holyoke, Mass., will run its machines on its specialties in canary, straw, lilac, robin's egg, dark blue, light buff and dark buff colors. Orders should be sent in early.

The Boston Belting Company, 256 Devonshire street, Boston, and 100 Chambers street, New York, has issued a new illustrated catalogue and price list of fire hose and fittings. This is a useful work which mill owners can secure by writing for it.

The Ajax Metal Company, Philadelphia, Pa., has appointed as its Western agents F. A. Lester & Co., 827 Monadnock Block, Chicago. This firm will represent all of the Ajax Metal Company's products, including bearing metals, electrical supplies, roofing plates, &c.

THE "Hamilton" Felt.

"Best and Most Economical Made."

The Longest Runs

are always made with the "Hamilton." Once accustomed to its use, you will buy no other. Prices as low as inferior makes are sold at.

In ordering mention kind of stock used, quality of paper made and speed of machine.

Shuler & Benninghofen, Hamilton, O.

The W. S. Tyler Wire Works Co.,

CLEVELAND, OHIO.

MANUFACTURERS OF

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Cylinder Faces and Washer Wires.

THE GENERAL FIRE EXTINGUISHER COMPANY,

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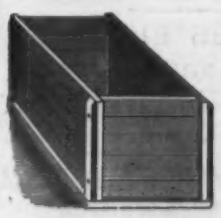
CHICAGO: Pullman Building.
CLEVELAND: Society for Savings Building.
BOSTON: 173 Devonshire Street.
BUFFALO: City Bank Building.
ST. LOUIS: 806 Rialto Building (Rialto).
Also at WARREN, OHIO, and COLUMBUS, GA.

AND AT THE

EXECUTIVE OFFICES, PROVIDENCE, R. I.



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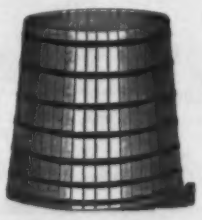

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Mill Architect and Contractor.

Specialties: PAPER MILLS AND SULPHITE FIBRE MILLS.

Plans Furnished and Mills Constructed on shortest possible notice.

A Co-operative Town.

The Philadelphia *Record* says: Oldham (Lancashire), although, comparatively speaking, a modern town, and peopled almost exclusively by the working classes, holds the lead in many respects, but especially in its co-operative movements. No town in the kingdom owns as many joint stock or limited companies, which in their turn have created other co-operative combinations.

"Its co-operative stores consist of two societies, each with a membership of nearly 11,000. These societies were the pioneers of the 'limited' movement in Oldham, and the cotton industry was the first business they began with. Such rapid strides has it made that Oldham is known far and wide as the 'divi.' The co-operative societies spread still further, and now, in conjunction with the societies in adjacent towns, own a large corn mill, thus sharing the profits to be made from grinding the grain.

"There are in Oldham district, in the cotton trade alone, about 150 limited companies, the majority of which have been formed since 1872, with capitals varying from £10,000 to £15,000, chiefly divided into £5 shares. These companies, seeing the profits accruing from buying the raw material, at once formed the Oldham Cotton Buying Company, Limited, almost every company having shares; consequently it is to their own interest to do business with the company and thus share in the profits. But they do not stop here. Seeing the large profit made by the insurance companies, they decided to form one of their own, and the Federative Insurance Company, Limited, sprang into existence, each company holding a number of shares and encouraging it by transferring their insurance business to it.

"It is no uncommon thing for some of the cotton companies to consist of 400, 500, and in some cases 700 shareholders, almost all residing in Oldham. Scarcely a family in the town but that own shares in some cotton company or other.

"The company movement does not stop with the staple trade (cotton). The butchers were not long behind, and then was formed the Oldham Hide, Skin and Fat Company, Limited, which effectually demoralized private enterprise in that direction. Even the bill posting and advertising business was invaded, the printers forming the Oldham Bill Posting Company, Limited, through it posting their own bills and advertisements. The publicans were not left in the cold, and very soon two aerated water companies were in full swing, each publican, so long as he dealt with the company, holding so many shares. These he must relinquish when he ceases to deal with them. In fact, there is no business, not even poultry farming, which has escaped the company craze, and it is a byword that at one time you could have floated a dog kennel in Oldham."

Cost of Living in England.

Besides the rent of his house, the English workingman must pay all rates, taxes, church tithes and water rates on the property, and must keep the house in repair inside and leave it in good condition. There are still other elements entering into the cost of living in England, of which the American workman knows nothing, viz., stamp duties, licenses, &c. If he wishes a lease or perhaps a deed for the property, he must have said document stamped by the Government with a stamp of the value of from 15 cents to $2.50, according to the rental agreed upon. If he desires to go into domestic service, he or his employer must pay a Government license of $3.75 per annum.

If he has a bright, intelligent son with a taste for the law, before he can become an indentured clerk to a "solicitor" he must first pay the "Crown" the sum of $400, and after completing his studies he must take out a further license at the cost of $250 before he can present a case in court or at the bar. If he wishes to become a notary public, he must be at a further cost of $150. If, however, the young man's tastes run toward medicine, a license fee of $50 is required before he can practice. There are perhaps more whose tastes run in the direction of matrimony; a special license for the same costs $25.

If the English workman has a little savings in the bank he must pay the Government 2 cents for every check he draws. He must pay the same for every receipt he signs of amounts over $10. All notes or due bills must also bear a Government stamp of from 25 cents to several dollars, according to the amount. If he keeps a dog he must have an annual Government license of $5 for each canine. If he keeps a gun he must show a $2.50 license, and to shoot winged game he must pay $15. If he be a tradesman who keeps a horse or pony, and wishes to keep a carriage for the pleasure of his family, he must pay the Government $2.50 per wheel per annum.

Thus we find many more two wheel than four wheel carriages throughout all England. These, and many more of a like kind, are incidental expenses not often taken into consideration when comparing the costs of living, and might fairly be classed under the head of rent, as every householder feels them to a greater or less extent, and they become part of the annual cost of living, although not coming under the head of clothing or food.

Oil Testing Machine.

A machine for testing the endurance of oil is constructed as follows: A shaft 30 inches long, turned and ground to 2½ inches in diameter, supported at each end by bearings and arranged to rotate at various speeds; a pair of half-moon boxes nicely fitted to this shaft, immersed in a cavity filled with oil; in the top box is a thermometer, and oil holes made to receive a given quantity of oil to be tested. The boxes are held together by a weighted lever, thrusting the boxes against the shaft with the required pressure per square inch. On one end of this shaft is fitted a dynamometer to denote the friction between boxes and shaft.

When the shaft is set in motion the temperature of the boxes is noted, also the increase of friction by the dynamometer; as the box commences to increase in temperature and the oil is partly consumed, the friction on the dynamometer increases. The number of minutes is noted from the starting up to stopping. The result of the test is as follows: Eight drops of oil is used for the test of 30 gravity and of 350 flash test, which lasted under a pressure of 400 pounds to the square inch twenty minutes. The reading of the thermometer to start with was 70°, at the close of the test 140°. Amount of power consumed by the dynamometer to start with was one-sixteenth of a horse power; at the termination of the test one-eighth horse power, revolution of shaft 400. Another oil may be tested under the same conditions and the relative qualities of lubrication and economy intelligently compared.

The viscometer is a substitute for the hydrometer for testing the gravity or density of oils. It is constructed as follows: A vessel containing one pint, arranged with an orifice of one-sixteenth of an inch in diameter is made at the bottom of the vessel. A thermometer is immersed in the oil and a uniform temperature is maintained. The quantity of oil that will flow through this orifice in a given time at a given temperature is called the viscosity of the oil.—*Manufacturers' Gazette.*

Mechanical Efficiency of Pulley Blocks.

In the course of some tests of the efficiency of hoisting tackle recently made, according to the *Mechanical World*, some interesting conclusions regarding the power wasted in pulley blocks were arrived at. The tests were made chiefly for the purpose of determining the power wasted by unlubricated blocks. A two sheave tackle, which had been lying for a long time, the bearing surfaces being dry and dirty, was procured and tested by slowly hoisting weights by man power applied through a compound tackle, the effort expended being measured by a spring balance. The same tests were made with bearings cleaned but not lubricated, and repeated after they had been lubricated. The upper block of the tackle had roller bushes for the sheaves, and the lower one plain brass fixtures.

The efficiency of the tackle, when well lubricated with graphite grease, ranged from 77 to 80 per cent., the efficiency being greater as the weight was increased. This increase in efficiency seems to have been wholly due to the decrease in the weight of the lower block as compared with the weight lifted, as by taking the block into account the efficiency is practically the same for all tests recorded, or 82.3 per cent. As compared with lubricated blocks, the blocks cleaned but dry show a loss of 8.5 per cent., while dry and dirty blocks show a loss of 21 per cent. The difference between the clean and dry blocks and the lubricated blocks would of course have been greater if the upper sheave had been provided with a plain bearing like that of the lower one, as the friction of the bearing when dry would have increased. It is probable, however, that the friction of a dry and dirty roller bearing would be as great as that of a plain bearing. Of course these tests can only be taken as indicating in a general way the degree of mechanical efficiency obtained in such apparatus. No doubt some of the ingenious arrangements now made would give better results than those referred to above, but it is equally probable that many others would be sensibly inferior if tested under actual working conditions.

WANTED—TWO MACHINE TENDERS thoroughly competent to run one, two or three cylinder machine on all grades paper; none but experienced men need apply; steady work and good wages. Address X. Y. Z., care Paper Trade Journal.

Competent Engineers.

A careful, competent engineer, one who values his life, should upon taking charge of a steam plant familiarize himself with every detail and part of the engines, pumps and machinery in his care. Many a man has lost his life or limbs through carelessness or for the want of knowledge of how all the parts of an engine are constructed. It is only quite recently that an engineer in this city had two fingers sheared off while endeavoring to adjust an oil cup on the main journal of his engine. The crank pin disk contained the parts which composed the governor, and his fingers getting too close to the back of the disk were sheared off by the springs used as part of the governor. It was a very fortunate thing that he got off so easy.

Then, again, every valve connected with the plant should be examined carefully, packed and reground when found necessary. Astonishing as it may seem, we know of a large plant in this city where the valves had evidently not been operated for several years, as one valve containing a 1 inch stem was twisted entirely off in an endeavor to close it.

We are unable to understand why it is that plants run on this plan run as long as they do without breaking down. All valves should be operated at least once a week.

The piping should all be looked after and traced up. It very often happens that hundreds of feet of dead piping are found condensing the steam as fast as made. This should all be cut out at once, and the source of supply plugged up. Follow your piping from your boiler to your engine, to your pumps, &c., also your water supply to your boiler pumps, heater, &c. This is all time and labor well spent, and after the first overhauling, if kept up at regular intervals, results in large savings of steam, which means a saving in the coal bill as well as in water. An engineer who has a full knowledge of the construction and operation of his plant, and is able to lay his hands upon every part of his machinery, &c., will be saved many a wearisome hour and sleepless night, as well as be a benefit to his employer, by reducing his operating expenses to a minimum. Every engineer should be master of the plant in his charge, and this requires intelligent care and management of the different departments in his charge. *Inland Engineer.*

Nominal Horse Power.

W. H. Wakeman calls attention again to the fact that the commonly employed standards for computing power of steam engines and boilers are in somewhat the same condition as is the question of wire and sheet metal gauges. That is to say, when a "50 horse engine" is referred to, and we know nothing else concerning it, we are almost as much in the dark as we are when "No. 7 wire" is mentioned and nothing is said about the particular gauge referred to.

Especially in these days of widely varying practice as to piston speed and steam pressure the term "100 horse-power engine" means widely different things when used by different builders, and means pretty nearly nothing at all in many instances in which it is used.

If we confine ourselves to the consideration of engines built by one builder we can be reasonably (though not absolutely) certain that his "100 horse-power engine" will develop twice as much power as his "50 horse-power engine," and half as much as his "200 horse engine" at the same piston speed and initial pressure, but our definite knowledge of what the terms mean may be said to be inversely proportional to the number of builders whose engines are considered; and in connection with boilers the term horse power is still less definite and enlightening.

Some years ago Professor Sweet proposed in our columns a remedy for this confusion, so far as engines are concerned. He proposed that builders should specify the horse power developed by the engine at its designed rate of speed per pound mean effective steam pressure. In other words, instead of a statement of possible or attainable gross horse power of engines, what has sometimes been called their "horse power constants" would be given. This would mean something—to an engineer at least—something upon which comparisons could be based and an intelligent conclusion arrived at. We are not aware that any engine builder has adopted this plan of rating engines, not even Professor Sweet himself, but that it would have its advantages seems very plain.

In the case of a boiler the matter is not quite so simple, probably because the power which can be developed from it depends upon so many conditions—all those conditions which apply to the engine besides some of its own; and to tell the average boiler buyer that a given boiler will evaporate so many pounds of water from and at 212° Fahr. is to tell him nothing that he has or can acquire the least comprehension of—much less of its bearing upon what he wants to know, *i. e.*, how much coal will be required to run the plant. Whether or not any plan can be formulated by which the average man who pays for steam plants can be made to understand all these things is a problem, and it is also questionable whether there is any particular use in trying. An effort should be made to use such definite terms and expressions as will enable engineers to know what is meant, and others can employ the engineers when in need of information respecting particular plants or sets of conditions.—*American Machinist.*

Noble & Foss Machine Co.,
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Manufacturers of
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Iron or Wood Tubs, Laid or Steel Bars and Knives. Bed Plates and Jordan Fillings of every description a specialty. Correspondence solicited.

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This Wheel is considered one of the most correct that has been devised; gives high results, and with late improvements is the Best, Most Practical and Efficient Partial Gate Wheel in existence.
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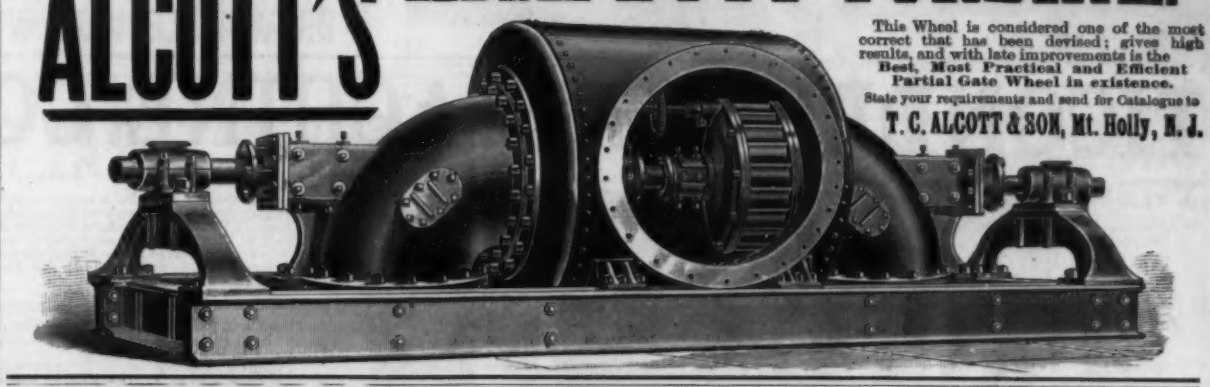

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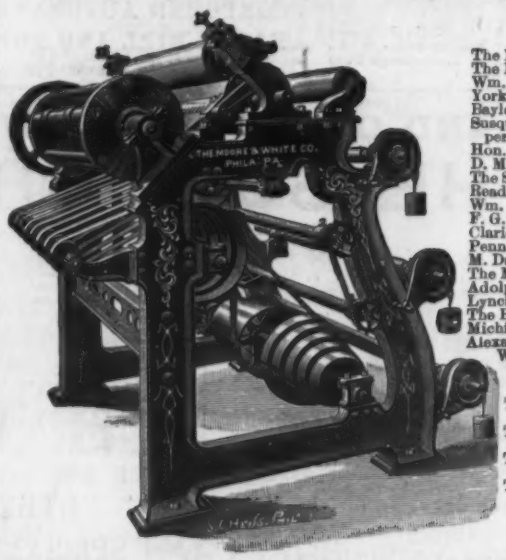

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D. M. Bare & Co., 2
The Singerly Pulp and Paper Co., 5
Reading Paper Mills, 1
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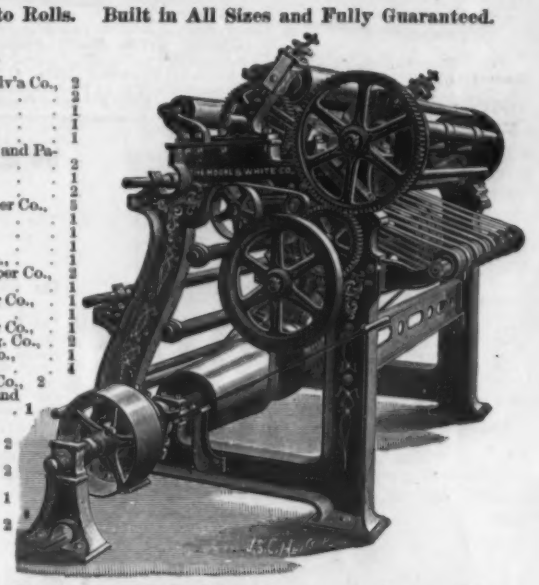

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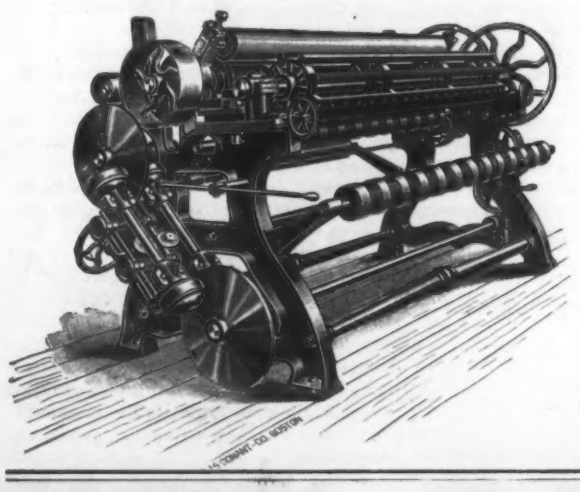

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WE HAVE EIGHT RUNNING IN ONE FINISHING ROOM.

AFTER USING ONE SEVEN MONTHS A CUSTOMER SAYS: *"You have the Perfect Cutter. We are sure it will save its cost in one year in the saving of waste paper alone."*

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WE HAVE SOLD A FEW SCREENS, AS FOLLOWS:

HOUSES.	CITY AND STATE.	SCREENS.	ORDERS
The Rumford Falls Paper Co.	Rumford Falls, Me.	20	..
The Niagara Falls Paper Co.	Niagara Falls, N. Y.	18	..
High Falls Sulphite Pulp Co.	Potsdam, N. Y.	10	..
The Empire Pulp Co.	Black River, N. Y.	1	..
Globe Paper Co.	Brownville, N. Y.	2	..
Union Pulp Co.	Carthage, N. Y.	1	..
Frontenac Paper Co.	Dexter, N. Y.	1	..
Leonard & Gilmore	Dexter, N. Y.	1	..
Cutterson Paper Co.	Brownville, N. Y.	3	3
Oswego Falls Paper Co.	Fulton, N. Y.	4	3
Gouverneur Wood Pulp Co.	Gouverneur, N. Y.	4	4
Knowlton Paper Co.	Watertown, N. Y.	1	..
Ontario Paper Co.	Watertown, N. Y.	2	2
Herkimer Paper Co.	Lyons Falls, N. Y.	4	3
G. H. P. Gould	Port Leyden, N. Y.	1	..
Gould Paper Co.	Port Leyden, N. Y.	2	2
Racquette River Pulp Co.	Colton, N. Y.	3	..
Sparks Manufacturing Co.	Hamburg, N. J.	1	..
Charles Callender	Glendale, Mass.	2	2
Merrimac Paper Co.	Lawrence, Mass.	2	2
Connecticut Paper Co.	Holyoke, Mass.	1	..
Carew Manufacturing Co.	South Hadley Falls, Mass.	2	2
Rice, Barton & Fales	Worcester, Mass.	3	2
Eaton, Dikeman & Co.	Lee, Mass.	1	..
Fall Mountain Paper Co.	Bellows Falls, Vt.	12	7
Wyman, Flint & Sons	Bellows Falls, Vt.	3	2
National Metal Edge Box Co.	Readesboro, Vt.	1	..
Glen Manufacturing Co.	Berlin Falls, N. H.	6	3
Wilder & Co.	Ashland, N. H.	1	..

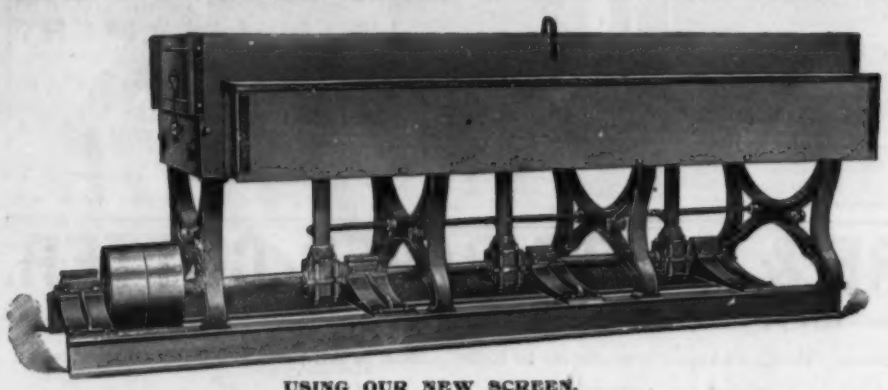
HOUSES.	CITY AND STATE.	SCREENS.	ORDERS
Umbagog Pulp Co.	Livermore Falls, Me.	2	..
Bangor Paper Co.	Bangor, Me.	4	..
Jay Paper Co.	Jay, Me.	1	..
White & Wells	Waterbury, Conn.	2	2
St. Cloud Paper Co.	St. Cloud, Minn.	1	..
Columbia Paper Co.	Buena Vista, Va.	2	..
Anderson Paper Co.	Anderson, Ind.	3	2
Kaukauna Paper Co.	Kaukauna, Wis.	1	..
Willamette Pulp and Paper Co.	Oregon City, Ore.	9	4
California Paper Co.	Agnews, Cal.	1	..
Tennessee Pulp Co.	Memphis, Tenn.	1	..
Estate of Richard Carter	Glendale, N. Y.	1	..
Charles Wackerhagen	Canaan Four Corners, N. Y.	1	..
Smeallie, Phillips & Co.	Amsterdam, N. Y.	1	..
O. E. Martin	Norwood, N. Y.	1	..
Jefferson Paper Co.	Black River, N. Y.	3	3
St. Lawrence Paper Co.	Dexter, N. Y.	3	3
Payne & Blinn	Chatham, N. Y.	1	..
M. M. Pillsbury	Napanoch, N. Y.	1	..
Victoria Paper Co.	Fulton, N. Y.	2	2
Philip McGuire	Forestport, N. Y.	1	..
Hartland Paper Co.	Middleport, N. Y.	1	..
Standard Pulp Co.	Jennie's Falls, N. Y.	3	..
Bacon Paper Co.	Lawrence, Mass.	1	..
Watertown Paper Co.	Watertown, N. Y.	3	3
Alpena Sulphite Pulp Co.	Alpena, Mich.	4	3
Hollingsworth & Whitney	Winslow, Me.	2	2
Fulton Paper Co.	Fulton, N. Y.	2	2

AND OTHERS.

BROWNVILLE IRON WORKS, Brownville, N. Y.

ALSO MANUFACTURERS OF
Wet Machines, Centrifugal Pumps, &c.

TICONDEROGA MACHINE CO., TICONDEROGA, N. Y.



USING OUR NEW SCREEN.

Glen Manufacturing Co., Berlin Falls, N. H., 13; Barclay Fibre Co., Sangerties, N. Y., 8; Katahdin Pulp and Paper Co., Lincoln, Me., 10; Haverhill Paper Co., Haverhill, Mass., 2; The J. & J. Rogers Co., Ausable Forks, N. Y., 10; New York and Pennsylvania Co., Johnsonburg, Pa., 1; H. J. Roberts, Birmingham, Conn., 1; Ticonderoga Pulp and Paper Co., Ticonderoga, N. Y., 4; Piscataquis Falls Pulp and Paper Co., Enfield, Me., 2

USING OUR OLD SCREEN.

Piscataquis Falls Pulp and Paper Co., Enfield, Me., 12; Howland Falls Pulp Co., Howland, Me., 10; Penobscot Chemical Fibre Co., Great Works, Me., 4; Willamette Pulp and Paper Co., Oregon City, Ore., 1; Bangor Pulp and Paper Co., Basin Mills, Me., 2; Kane's Falls Pulp Co., Fort Ann, N. Y., 2; Westmoreland Paper Co., West Newton, Pa., 6; Dexter Sulphite Pulp and Paper Co., Dexter, N. Y., 3; Otis Falls Pulp Co., Livermore Falls, Me., 3; Michigan Sulphite Co., Port Huron, Mich., 2; Singerly Pulp and Paper Co., Singerly, Md., 1; Ticonderoga Pulp and Paper Co., Ticonderoga, N. Y., 7.

USING OUR BARKERS.

The J. & J. Rogers Co., Ausable Forks, N. Y., 4; Katahdin Pulp and Paper Co., Lincoln, Me., 4; High Falls Sulphite Pulp and Mining Co., Potsdam, N. Y., 2; Glen Manufacturing Co., Berlin Falls, N. H., 4; Oswego Falls Pulp and Paper Co., Fulton, N. Y., 1; Treadwells Mills Pulp and Paper Co., Plattsburgh, N. Y., 3; Shenandoah Pulp Co., Harper's Ferry, W. Va., 3; Miller Bros. & Co., Glen Miller, Ont., Canada, 1; Piscataquis Falls Pulp and Paper Co., Enfield, Me., 6; Kane's Falls Pulp Co., Fort Ann, N. Y., 1; Manufacturing Investment Co., Madison, Me., 9; Umbagog Pulp Co., Livermore Falls, Me., 2; Moosehead Pulp and Paper Co., Solon, Me., 1; Bennington Falls Pulp Co., Middle Falls, N. Y., 1; Saranac River Pulp and Paper Co., Cadyville, N. Y., 1; Smith & Martin, Plattsburgh, N. Y., 1; Otis Falls Pulp Co., Livermore Falls, Me., 1; Hollingsworth & Whitney Co., Waterville, Me., 3; Gilbert & Bell, Waterford, N. Y., 1; Laurentide Pulp Co., Montreal, Canada, 1; Hudson River Pulp and Paper Co., Palmer's Falls, N. Y., 1; Battenkill Paper Co., Greenwich, N. Y., 1; Ticonderoga Pulp and Paper Co., Ticonderoga, N. Y., 1.

MANUFACTURERS OF

COMPOUND AUTOMATIC HIGH SPEED STEAM ENGINES,
PAPER MILL AND POWER TRANSMITTING MACHINERY.

SEND FOR CATALOGUE AND BLUE PRINTS.

WE LEAD, AND OTHERS FOLLOW! Over 200 "SUCCESS" Screens in use on all kinds of stock.

"THE SUCCESS" LEADS THEM ALL.

READ THE FOLLOWING LIST OF USERS AND BE CONVINCED:

The Glens Falls Paper Mill Co., Glens Falls and Fort Edward, N. Y.	**91**	Agawam Paper Co., Mittineague, Mass.	1
The Hudson River Pulp and Paper Co., Palmer's Falls, N. Y.	**50**	The Worthy Paper Co., Mittineague, Mass.	1
The Burgess Sulphite Fibre Co., Berlin Falls, N. Y.	12	Chester Paper Co., Huntington, Mass.	1
Marinette and Menominee Paper Co., Marinette, Wis.	8	Bayless Paper Co., Binghamton, N. Y.	3
Combined Locks Paper Co., Combined Locks, Wis.	4	Wagman & Thorp Co., Fort Miller, N. Y.	2
Wilkinson Bros. & Co., Derby, Conn.	5	Moore & Thompson Paper Co., Bellows Falls, Vt.	1
Sandy Hill Power and Pulp Co., Sandy Hill, N. Y.	4	Allen Bros. Co., Sandy Hill, N. Y.	1
The Riverside Paper Co., Holyoke, Mass.	**4**	Hudson River Water Power and Paper Co., Mechanicsville, N. Y.	1
The Holyoke Paper Co., Holyoke, Mass.	1	Ohio Paper Co., Niles, Mich.	1
Franklin Paper Co., Holyoke, Mass.	1	Otis Falls Paper Co., Livermore Falls, Me.	19
Chemical Paper Co., Holyoke, Mass.	2	J. D. Mulrenan, Hadley, N. Y.	2
Beebe & Holbrook Co., Holyoke, Mass.	2	Saranac River Pulp and Paper Co., Cadyville, N. Y.	2
A. H. Hubbard Co., Norwich, Conn.	2	Herkimer Paper Co., Herkimer, N. Y.	3
		Winnipisiogee Paper Co., Franklin, N. H.	2
		Jas. Ramage Paper Co., Monroe Bridge, Mass.	1

Wilder & Co., Olcott Falls, Vt.	3
Syms & Dudley Paper Co., Watervliet, Mich.	2
The Little Chute Pulp Co., Little Chute, Wis.	6
Niagara Falls Pulp and Paper Co., Niagara Falls, N. Y.	1
Kimberly & Clark Co., Kimberly, Wis.	2
Atlas Paper Co., Appleton, Wis.	1
Shattuck & Babcock Co., De Pere, Wis.	2
The Wanaque River Pulp and Paper Co., Wanaque, N. J.	2
Nekoosa Paper Co., Nekoosa, Wis.	7
Niagara Falls Paper Co., Niagara Falls, N. Y.	2
The Maritime Sulphite Fibre Co., Chatham, New Brunswick, Canada	4
The Uncas Paper Co., Norwich, Conn.	1
Sandy Hill Pulp Co., Sandy Hill, N. Y.	1
Kimberly & Clark Co., Neenah, Wis.	3

MADE IN THREE SIZES: SIX, EIGHT AND TEN PLATES.

Wood Pulp Grinders, Improved Patterns.
Wet Machines, Improved Patterns.
Friction Pulleys and Couplings.

OTHER SPECIALTIES:

Double and Single Stuff Pumps, Improved Patterns.
Soft Steel Slitters, Improved Patterns.
Wood Chippers.

FRICTION PULLEY AND MACHINE WORKS, SANDY HILL, N. Y.,

SOLE MANUFACTURERS OF THE "SUCCESS" SCREEN.

Long Distance Water Power Transmission.

Various modifications of turbines and water motors have in recent years been applied to the utilization of water powers heretofore thought impracticable, but which have become available through the introduction of the electrical system of transmission. Water powers located at inaccessible points can be made to furnish or transmit the power to places of convenience, where it can be utilized for any purpose in demand, the distance of such transmission being limited only to cost of the transmission line, the generator and the motor, long lines, of course, sacrificing to a greater or less extent the available effect, but frequently are desirable even at considerable loss of power.

There are, according to the *Electrical Review*, three pairs of water wheels at the Falls of Juanacatlan, Mexico, each of which is rated at 600 horse power, or, approximately, an aggregate of 1,800 for the three pairs; but two pairs only are in constant use, the other pair being held as a reserve power, and to be used in case of accident in the motive power plant. The distance over which the power is transmitted is nearly 18 miles, being situated over 17 miles from Guadalajara, one of the largest cities in the Republic of Mexico, to which point this power is carried and the electric lighting of the city accomplished.

These 20 inch turbines are placed under a head of 60 feet, and are producing remarkably fine results. They combine a number of new features and important improvements adapted to turbine use, and their automatic regulation has proven highly satisfactory. They represent the highest art in turbine building, the wheel, or runner proper, being made of bronze, the shafts of the best hammered scrap wrought iron, and other parts of the combination requiring strength are made of steel, the whole design being of the most perfect construction.

The transmission of the power from the turbines is made to an intermediate line shaft, from which shaft the power is taken to the generators, and is accomplished by the modern hemp rope improved transmission. The ropes are of the continuous style, passing from a groove in the pulley on the water wheel shaft to a groove in the pulley on the main power line, and from that groove returning again to an adjacent groove on the water wheel pulley, and thence to another groove on the main line, thus returning back and forth until sixteen grooves are filled on the water wheel shaft. In order to keep the rope taut, a carriage is placed between the pulley and the water wheel shaft on the main line, to which is attached a counter weight; this carriage pulls back and forth, somewhat upon the cable railway plan, thus easily and nicely effecting a uniform tension in the rope in all conditions of the atmosphere and under all variations of power given by the wheels.

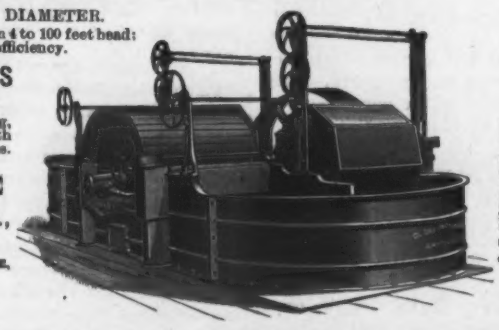
The power is taken from the pair of 20-inch water wheels by two of these rope pulleys, one placed on each side of the pair of wheels. Of course the same arrangement is observed in both of the other pair of wheels, all being connected to the same main intermediate line shaft, from which the power is belted to the generators.

NEW AMERICAN TURBINE.

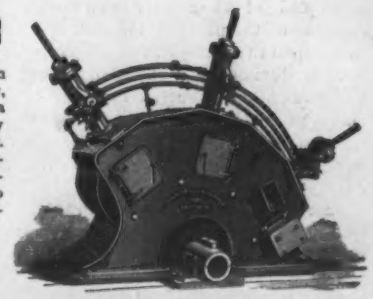
FROM SIX TO SIXTY-SIX INCHES DIAMETER.
Are in practical operation under heads from 4 to 100 feet head; are strong, durable and give high efficiency.

BEATING ENGINES
Cast Iron or Wood Tubs.
Made heavy and strong, double lightered, with well made Cone Washers.

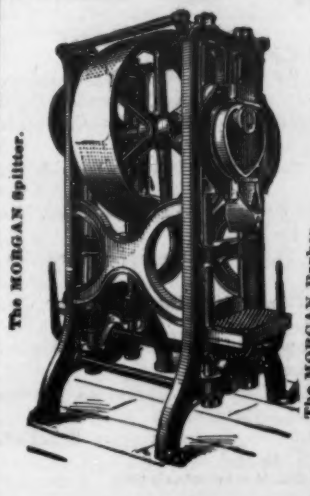
DAYTON GLOBE IRON WORKS CO.,
Successors to STOUT, MILLS & TEMPLE,
Dayton, Ohio, U. S. A.



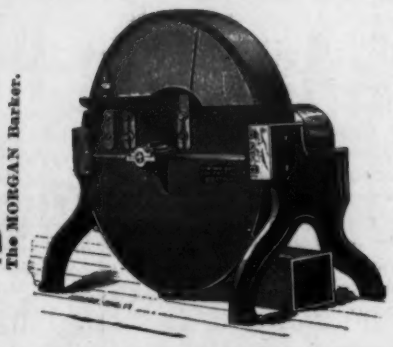
D. T. MILLS'
WOOD PULP GRINDER
Superior in construction to any made. Capacity, 4,000 to 6,500 pounds extra good pulp per day, dry weight, per each grinder. Hydraulic feeds, fine adjustments; strong and reliable in every way. Two and three pocket machines.
Descriptive Catalogue Sent Free.



APPLETON MACHINE COMPANY,
APPLETON, WIS.,
—MANUFACTURERS OF—
The New Frambach and Badger Pulp Grinders,



The MORGAN Splitter.

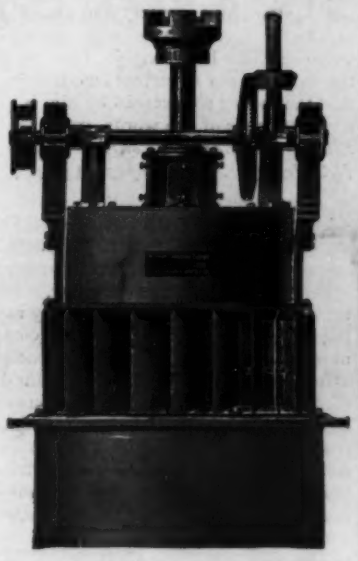


The MORGAN Barker.

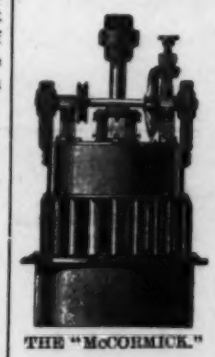
Wood Barkers,
Splitters,
Screens,
Bolt Sawing Machines,
Knot Borers,
Chippers,
Sulphur Burners
and
Wet Machines.

GOODRICK Screen.

J. & W. JOLLY, MANUFACTURERS OF
McCORMICK'S HOLYOKE TURBINES,
BOTH VERTICAL and HORIZONTAL.
PAPER MILL MACHINERY.
Allen's "Blue Spot" Preventative. Screens and Vats for Paper Machines.
RAG ENGINES AND JORDAN ENGINES MADE AND REFILLED.
Bleach Boilers, Fan Dusters, Ferry's Patent Star Dusters.
PAPER CALENDER ROLLS MADE AND REPAIRED. CHILLED ROLLS. SHEET, SUPER AND WEB CALENDERS.
POWER SUCTION PUMPS, STUFF PUMPS, POWER BOILER PUMPS, SUCTION BOXES AND PLATES, PULLEYS, SHAFTING, GEARING, &c.
HOLYOKE, MASS., U. S. A.



McCORMICK AND SUCCESS TURBINES,
VERTICAL OR HORIZONTAL.



THE "McCORMICK."

The McCORMICK Turbine gives more power per diameter with a higher percentage of useful effect from the water used than any other water wheel heretofore made. All sizes, both right and left hand, tested in the Holyoke testing flume.

The SUCCESS Turbine, long and favorably known in the paper trade as a first-class water wheel, possesses valuable features found in no other turbine, and gives a high percentage of useful effect from the water used.

THE McCORMICK and SUCCESS TURBINES are especially adapted for driving Paper and Pulp Mills and are extensively used by the largest manufacturers in the United States and Canada. Parties using wheels which are unsatisfactory and those contemplating the improvement of powers will find it to their interest to confer with me, as I am willing to guarantee results where others have failed, no matter what make of turbines has been tried.
State requirements and send for catalogue.

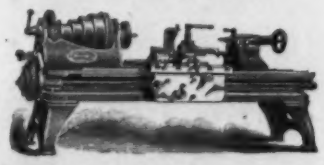
Heavy Power Transmitting Machinery a Specialty.

S. MORGAN SMITH, York, Pa.

THE "SUCCESS."

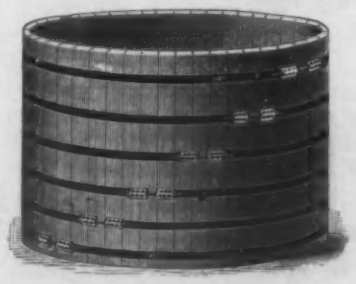
JEFFREY
Roller, Steel Drag, Cable and Special Chains
FOR
ELEVATING AND CONVEYING MACHINERY
FOR HANDLING MATERIAL OF ALL KINDS.
Power Transmission Machinery.
WIRE CABLE CONVEYORS.
For long & short distance Conveying.
THE JEFFREY MFG. CO. Columbus, Ohio.
163 Washington St., N. Y.
Send for Catalogue.

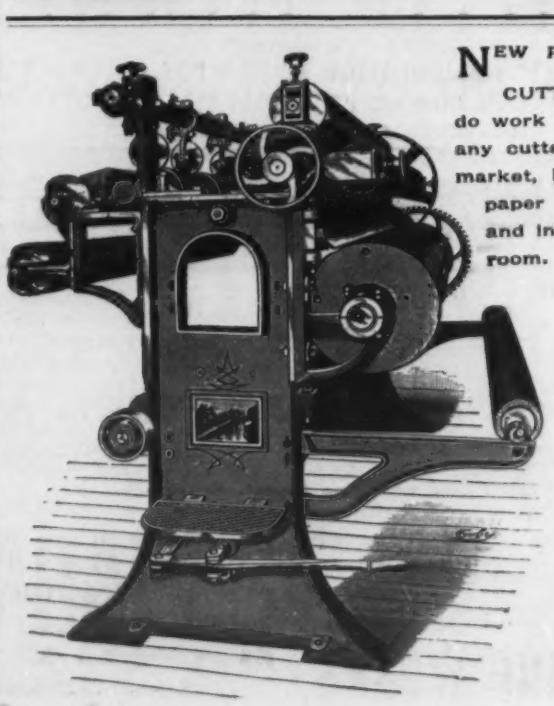
NEW HAVEN MANUFACTURING CO.,
NEW HAVEN, CONN.,
MANUFACTURERS OF



Lathes, Planers, Drills,
SLOTTERS, &c.

ESTABLISHED 1840.
GEO. J. BURKHARDT'S SONS'
Cedar Tank Factory,
2831 TO 2839 NORTH BROAD ST.,
Philadelphia.





NEW PATTERN CUTTER. Will do work equal to any cutter on the market, both on paper machine and in finishing room. . . .

Paper Mill Machinery.
FOURDRINIER AND CYLINDER MACHINES.
Very Substantial and Convenient Designs, Embodying all Late Desirable Improvements.

IRON AND WOOD TUB BEATING ENGINES.

Wet Machines, Rag Cutters, Duplex and Triplex Stuff and Suction Pumps, Double Suction Water Pumps, Etc., Etc.

ESTABLISHED 1858.
BELOIT IRON WORKS,
BELOIT, WIS., U. S. A.

—Thorough Inspection.—
Insurance against loss or damage to property; also against loss of life and injury by Steam Boiler Explosions.

General Agents.	*Offices.*
THEO. H. BABCOCK,	New York City, 235 Broadway.
CORBIN & GOODRICH,	Philadelphia, 432 Walnut street.
LAWFORD & McKIM,	Baltimore, Md., Chamber Commerce.
C. E. ROBERTS,	Boston, Mass., 125 Milk street.
	Providence, R. I., 29 Weybosset street.
H. M. LEMON,	Chicago, Ill., 113 Quincy street.
C. C. GARDINER,	St. Louis, Mo., 319 North 4th street.
L. B. PERKINS,	Hartford, 216 Main street.
W. G. LINEBURGH & SON,	Bridgeport, 2 Sanford Building.
BURWELL & BRIGGS,	Cleveland, 236 Superior street.
MANN & WILSON,	San Francisco, 306 Sansome Street.
W. S. HASTIE & SON,	Charleston, S. C., 44 Broad street
ZOLLARS & McGREW,	Denver, Col., 423 to 425 Mining Exchange Building.
L. V. CLARK & CO.,	Birmingham, Ala., 110 North 19th st.
PETER F. PESCUD,	New Orleans, 188 Gravier street.

Legal Decisions.

[SPECIALLY REPORTED FOR THE PAPER TRADE JOURNAL.]

Validity of Assignment of Pledge.—An assignment of his interest in a mortgage and notes pledged as security for a loan by the executor of the pledgee is valid, and not a fraud upon the pledgor, though payment is not first demanded of the pledgor, nor notice given him that such assignment is to be made, as it does not affect his position or right to redeem.—*Drake v. Cloonan (Supreme Court of Michigan), 57 N. W. Rep. 1098 (65).*

Damages for Breach of Warranty.—One who has bought from an experienced maker the best appliance made by him for the use intended, which appliance should have lasted for years, but broke, at a hidden flaw, after a proper usage of two months, cannot recover from the maker, as part of his damages for breach of warranty, money he has paid without suit, to his servant, for bodily injuries caused by the breakage.—*Roughan v. Boston and Lockport Block Co. (Supreme Judicial Court of Mass.) 36 N. E. Rep. 461 (84).*

Presentment of Check.—In order to charge the drawee of a check the same strict rule of diligence in making demand and giving notice of non-payment does not obtain as in cases of ordinary bills of exchange. As a general rule he is not discharged unless he suffers some loss in consequence of the delay of the holder. If the drawee of a check has no funds on deposit to meet it, or if having funds in the bank at the time he afterward withdraws them, and the check is not paid on that account, the drawee, having suffered no injury by reason of delay in its presentment, will not be discharged from liability; but when a person, having funds on deposit in a bank, draws a check against them the holder of the check, if he delays its presentment, assumes the risk of the failure of the bank. The fact that the check is presumed to be drawn against deposited funds makes it of even greater importance than in the case of a bill, that a check should be presented, and that the drawer should be notified of non-payment, in order that he may speedily inquire into the causes of refusal, and be placed in a position to secure his funds which were deposited in the bank. The rule, however, as to the time allowed the holder for presentment of a check, in order to relieve him from the risk of loss by failure of the drawer, is definitely fixed by the authorities: (1) Where the payee to whom the check is delivered receives it in the place where the bank on which it is drawn is located, he must present it by the close of banking hours on the next business day. (2) Where the check is drawn on a bank located at a place distant from that in which it was received by the payee, it must be sent for presentment for payment by mail on the next secular day after it is received, and presented on the next day after its receipt. For the purposes of collection the collecting bank must employ a suitable sub-agent. It must not transmit its checks or bills directly to the bank or party by whom payment is to be made with the request that remittances be made therefor. It is considered that no firm, bank, corporation or individual can be deemed a suitable agent, in contemplation of law, to enforce in behalf of another a claim against itself.—*Anderson v. Rodgers (Supreme Court of Kansas), 36 Pac. Rep. 1069 (422).*

Rights of Copartners.—The law regulating the rights of copartners is well settled. No partner has a right to take any part of the partnership property, either during the existence of the partnership or after it has been dissolved, and say that it is his exclusively. Each partner has a lien on the partnership property for the payment of the partnership debts, and also on the surplus remaining—after the liabilities are discharged—for his share. Each partner has an equitable lien on the partnership property for the purpose of having it applied in discharge of the debt of the firm; and he has a similar lien on the surplus assets for the purpose of having them applied in payment of what may be due to the partners respectively, after deducting what may be due from them, as partners, to the firm. This lien does not exist for any practical purpose until the affairs of the partnership have to be wound up; but when the partnership accounts have been taken, and the shares of the partners have been ascertained, then the lien of the partners on the assets of the partnership, and on each other's shares, becomes of the greatest importance. Each partner has a specific lien on the partnership stock, not only for the amount of his share, but for moneys advanced by him beyond that amount for the use of the partnership, as also for moneys abstracted by his copartner beyond the amount of his share. This lien, to be of any value to its holder, and to answer its fundamental purposes, must continue in full vigor, no matter what transformation the subject of it may undergo, until the debt it secures is paid, until each partner has received his full share of the surplus assets. The relation existing among copartners is one of mutual agency and trust and of great confidence, and consequently where a single partner sells all of the partnership property and receives the money for it, it must be held, according to well-established principles, that he holds the share of his copartners as trustee, and that the money so received by him is, in the strictest sense of the words, trust funds.—*Standish v. Babcock (Court of Chancery of New Jersey), 29 At. Rep. 326 (366).*

Liability of Telegraph Company for Failure to Deliver Message.—A regulation printed on the back of the blank prepared and furnished by the telegraph company in the following words: "No responsibility regarding messages attaches to this company until the same are presented, and accepted at one of its transmitting offices, and if a message is sent to such office by one of the company's messengers he acts for that purpose as the agent of the sender," was reasonable, and the company was not liable to the proposed sendee of such a message because of the failure of the messenger to whom it was intrusted to deliver it at one of the company's transmitting offices, and the company's consequent failure to transmit it and deliver to the person addressed. This is so notwithstanding the delivery of messages to such a messenger was usual and customary in the regular line of the company's business, and, according to its usage, it paid its messengers for every message delivered, and "for every message so received to be transmitted." By express stipulation the messenger was, as to the service he undertook, the agent of the sender and not of the company.—*Staney v. Western Union Telegraph Company (Supreme Court of Georgia), 18 S. E. Rep. 1008 (190).*

Validity of Affidavit by Mortgagee as Against Creditors.—Under the statute making void, as against creditors, chattel mortgages not accompanied by immediate delivery, followed by actual and continued change of possession, unless the mortgage, with an annexed affidavit of the holder, stating the consideration, and, as nearly as possible, the amount due and to become due, is recorded, an affidavit stating the consideration to be the indorsement of certain notes of the mortgagor, but failing to give the name of the payee or holder, the amount and date of each note, or to show that they were ever put into circulation and are still outstanding, is insufficient.—*Thropp v. Knight (Court of Chancery of N. J.), 28 At. Rep., 1077 (106).*

Admissibility of Parol Evidence as to a Contract.—A written order given to an agent to "please ship" a certain article, "for which we agree to pay" a fixed price, is not necessarily a contract, and when there is no evidence that such order was ever received and acted upon, parol evidence is admissible to prove that the article was delivered under a verbal agreement that it should be taken on a thirty days' trial and returned if it failed to give entire satisfaction, and parol evidence is admissible to prove that the order and an acceptance to a certain sight draft were obtained by false and fraudulent representations.—*National Cash Register Co. v. Pfister (Supreme Court of S. D.); 58 N. W. Rep. 270 (109).*

Validity of Deed of Trust.—The statute providing that every assignment by a debtor in trust for his creditors shall be for the benefit of all the creditors, and that provisions for preferential payments shall be void, and all debts (including judgments by confession thirty days previous to such assignment) shall be paid pro rata from the assets thereof, does not prevent an insolvent debtor from pledging property for the security of part of his creditors only. The fact that a chattel deed of trust, made to secure notes to part only of the grantor's creditors, empowers the trustee to take possession of the property and sell it at a private sale and hold the proceeds until the maturity of all the notes secured, does not make it a general assignment.—*Jaffray v. Matthews (Supreme Court of Missouri), 25 S. W. Rep. 187 (125).*

Moderately long belts are always to be preferred to short ones. When possible, the direction of the belt motion should be run from the top of the driving to the top of the driven pulley, and the pulling side should be the lower side. When tighteners are used they should be applied to the slack side of the belt, and they should be as large as possible in diameter. Belts should be run with the grain side next to the pulley, unless they become twisted or run untrue, in which case they may be reversed, at least temporarily, to advantage.

Paper Mill Designations.

Following is a continued list of named paper mills in America. In order to secure the post office address—which in many cases is more or less remote from the mill itself—and other particulars, reference to LOCKWOOD'S DIRECTORY OF THE PAPER, STATIONERY AND ALLIED TRADES is indispensable.

Paper Mills in Operation.

UNITED STATES.

Defiance Mill—Byron Weston Co., Dalton, Mass.
Delaware Paper Mills—Delaware Paper Co., Delaware, Ohio.
Dells Paper and Pulp Mills—Dells Paper and Pulp Co., Eau Claire, Wis.
Derby Paper Mills—Wilkinson Bros. & Co., Shelton, Conn.
De Pere Mills—Shattuck & Babcock Co., De Pere, Wis.
Des Plaines River Mill—Columbia Straw Paper Co., Joliet, Ill.
Detroit Paper Mill—St. Clair Paper Co., Detroit, Mich.
Diamond Mills—Adirondack Water Power and Paper Co., lessee, Malone, N. Y.
Diamond Mills—Morris & Boice, Chatham, N. Y.
Dorlan's Mill—Frank B. Ludwick, Downington, Pa.
Dove Mill—Megargee Paper Mill Co., Modena, Pa.
Draycott Mill—F. G. Weeks, Skaneateles, N. Y.
Dundee Paper Mill—Dundee Paper Co., Dundee, Mich.
Duplex Paper Mill—Geo. Shulmyer & Co., Slackwater, Pa.
Eagle Mill—Daniel & James B. Young, Bentley's Springs, Md.
Eagle Mill—Eagle Paper Co., Franklin, Ohio.
Eagle Mill—F. D. Knowlton, Dansville, N. Y.
Eagle Mill—F. R. Walker & Son, Burnside, Conn.
Eagle Mill—Geo. H. Friend Paper and Tablet Co., West Carrollton, Ohio.
Eagle Mill—George West, Factory Village, N. Y.
Eagle Paper Mills—James Guie & Sons, Downingtown, Pa.
Eagle Mill—M. J. Lawless & Co., Marcellus Falls, N. Y.
Eagle Mill—Smith Paper Co., Lee, Mass.
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East Downingtown Mill—S. Austin Bicking, Downingtown, Pa.
East Walpole Mill—Hollingsworth & Vose Co., East Walpole, Mass.
Eldora Mill—Eldora Paper Co., Eldora, N. J.
Elliot Mill—Mrs. J. C. Wall, City Mills, Mass.
Elm Mills—H. C. Dearborn & Co., Ashland, N. H.
Elmwood Paper Mills—Columbia Straw Paper Co., Elmwood, Ill.
Emerson Paper Mill—Emerson Paper Co., Sunapee, N. H.
Empire Mill—George West, Rock City Falls, N. Y.
Empire Mills—T. E. Sterne Paper Co., Chatham, N. Y.
Empire Mill—Walsh Paper Co., Cuyahoga Falls, Ohio.
Empire Mills—Wiley & Button, Schaghticoke, N. Y.
Enterprise Mill—M. D. Keeney & Sons, Antioch, Cal.
Erie Mills—H. F. Watson Co., Erie, Pa.
Essex Mill—Hunter & Shiland, Essex Junction, Vt.
Eureka Mill—H. S. Van de Carr, Stockport, N. Y.
Eureka Mill—The Ide & Haverstick Co., Bridgeport. Pa.
Evansville Paper Mill—Ferdinand Funke, Evansville, Ind.
Excello Mill—Harding Paper Co., Franklin, Ohio.
Excelsior Mill—George West, Rock City Falls, N. Y.
Fair Grove Mill—Louis Snider's Sons Co., Hamilton, Ohio.
Fallsburgh Mills—Edward Y. Lefever, Fallsburgh, N. Y.
Falls Mills—Seeley Paper Mill Co., Scotch Plains, N. J.
Falls of Neuse Paper Mills—Raleigh Paper Co., Neuse, N. C.
Federal Park Mill—Geo. F. Jones & Co., Baltimore, Md.
Flat Rock Mills—Martin & William H. Nixon Paper Co., Philadelphia, Pa.
Fordham Mill—The Louis Snider's Sons Co., Hamilton, Ohio.
Forest Mill—L. C. Cullen, Cheyney, Pa.
Forest Street Mill—Cleveland Paper Co., Cleveland, Ohio.
Fort Edward Paper Mill No. 2—Glens Falls Paper Mill Co., Fort Edward, N. Y.
Fort Edward Paper Mill No. 3—Glens Falls Paper Mill Co., Fort Edward, N. Y.
Fort Miller Paper Mill—Wagman, Thorpe & Co., Fort Miller, N. Y.
Fort Orange Mill—Fort Orange Paper Co., Castleton, N. Y.
Fort Scott Paper Mill—Fort Scott Paper Co., Fort Scott, Kan.
Fox River Mill—Fox River Paper Co., Appleton, Wis.
Franklin Mill—American Copying Paper Co., Suffield, Conn.
Franklin Mill—Harding Paper Co., Franklin, Ohio.
Franklin Mill—J. Howard Lewis, Swarthmore, Pa.
Franklin Mill—The Louis Snider's Sons Co., Hamilton, Ohio.
Franklin Mill—Wilson Lysle, Chesterville, Pa.
Freeport Paper Mill—F. Hickman & Co., Freeport, Ia.
Fulton Paper Mills—Estate of Thomas J. Scully, on Sugar Creek, DeKalb Co., Ga.
Gardner Mill—Tytus-Gardner Paper and Manufacturing Co., Middletown, Ohio.
Garoga Mill—Irvin Miller, Fort Plain, N. Y.
Gem City Paper Mill—American Straw Board Co., Quincy, Ill.
Ghent Mill—Higgins, Tremain & Lampman, Ghent, N. Y.
Gleason Mill—Phœnix Tissue Mills Co., Phœnix, N. Y.
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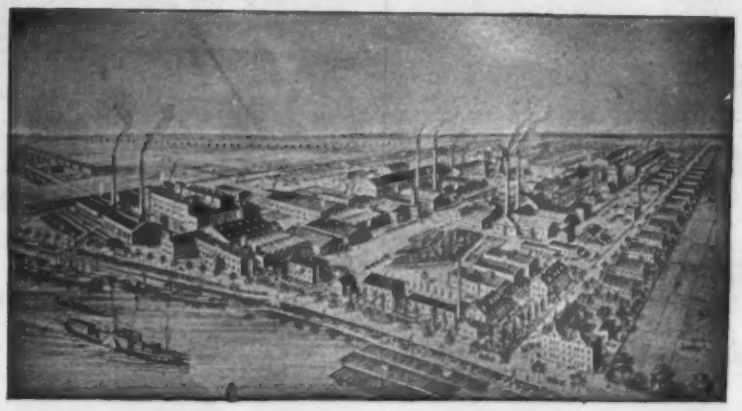

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Cost of Power from Prime Movers.

By G. G. Hiscox.

The cost of power is so much a variable quantity, depending as it does upon the cost of fuel and labor, together with the variable cost of a power plant in different localities, that no definite figure can be made for a general expression of its cost in terms of horse power per unit of time.

Strictly the prices of fuel, if used for power, and the cost of labor should be taken into account in every individual case and at any local point, in order to get at a fair estimate of total cost and a comparative running cost of power from any prime mover. Nor does the cost per horse power per day bear a uniform proportion for various sized power plants; in fact it is a sliding scale of an inverse order—the larger the power plant, the less will be its cost per horse power for a given time.

With steam power, the kind of engine, ranking from the common slide valve throttle governed, through all the grades of high speed automatic to the triple compound condensing engine, has also a sliding scale of economy, due to the particular modification of expansion and condensation, amounting to more than 50 per cent. from the steam cost of the cruder forms of steam plants.

Taking a medium price for steaming coal, say at $3 per net ton, a fair estimate for cost of coal for an ordinary high speed non-condensing engine, for a 500 horse power plant, is 6.4 cents per horse power per day of ten hours; falling as low as 3 cents per horse power per day in a triple compound condensing engine—the cost as above varying exactly with the price of coal.

The operating expenses other than coal vary very little in large steam plants, ranging from 5.6 cents per horse power per day in high speed non-condensing, to 5 cents for compound condensing; making the total cost 11.8 cents per horse power per day for a large high speed non-condensing steam plant, and 7.7 cents for a compound condensing steam plant of similar size. To this should be added the interest and depreciation on the cost of the entire plant.

For lesser steam plants, say from 100 to 50 horse power, requiring the constant attention of one person as engineer and fireman, the cost of labor and supplies is found to be nearly the same for 50 as for 100 horse power, so that for 100 horse power, 7 cents per horse power per day may be a fair average, while for 50 horse power it will rise to 12 cents for labor, supplies, interest, repairs and depreciation; to which add the cost of coal at 7 cents, making the total cost of running a 100 horse power plant equal to 14 cents per horse power per day, and a 50 horse power plant 19 cents per horse power per day.

It is well known that the cost of steam power per horse power increases as the rate of power decreases, so that no absolute estimate of cost per horse power can be made, except upon an especially defined plant, with all the items of cost of material, erection, fuel, labor and supplies considered.

Actual tests of the expense of running a steam engine of 8 horse power, supplying 10 indicated horse power, with coal at $4 per net ton and half wages for attendance, with 10 per cent. depreciation, 5 per cent. interest, has been found to be 31 cents per indicated horse power per day.

The cost of power from a waterfall, although its free use may in some cases entirely eliminate the cost of energy, and the labor of attendance be entirely merged in a person caring for the running machinery of a mill, by which the total cost of operating the power may be reduced to zero, is not by any means a free power. The item of cost of a water power plant and its economical location is often a bar to its usefulness; but when found available is a variable one by the difference in the cost of a wheel and flume for a high or a low head of water for a given power, and the great difference in the cost of building suitable dams to meet the requirements of the stream conditions.

In the large manufacturing centres of the Eastern and Middle States the total cost of water power, including interest on purchase of water right, dams, flumes and wheels, ready for operation, is from $10 to $15 per horse power per annum, or from 3.3 to 5 cents per horse power per day.

For small water powers the cost of a plant is so variable that it throws all calculations into the shade, unless it is based upon the fact of the quantity of water, height of fall and the natural position of the water privilege—all of which should be taken into the computation.

The turbine, the use of which is probably the cheapest method of developing water power with moderate water heads, has a great range of cost per horse power due to water head only, as a few figures will show.

A 15¼ inch turbine with shaft and pulley, at $185; flume and short race, with setting of wheel, $500; a small dam, $300; all in a favorable location; total, $985. With incidental expenses, say $1,000 for cost of plant, water privilege free. Interest, repairs and depreciation at 10 per cent., or $100 per annum.

With a 6 foot head of water the wheel will yield 1½ horse power, and the cost may be set down at $66 per horse power per annum. Now if nature has given the privilege of a 30 foot head, and with a cost of $200 in addition to the above for a higher flume, $120 will represent the annual cost and 23 horse power will be the yield, at $5.20 per horse power per annum.

The great disparity of first cost under the various conditions of a low head and large stream flow, or a high head and small stream flow, is a natural factor which controls the possibilities of a profitable power. From these conditions may be derived the axiom that where an expensive dam is required for any power, the total energy of the stream should be converted into power as a measure of profit.

The question of the cost of power by the use of the small motors now on the market is of frequent occurrence under the apprehension that quantity of water is all that is required, when in reality the hydrostatic head is the most important factor of economy of power in small hydraulic motors.

The method of arriving at an approximate cost per horse power with this class of motors is to obtain the gauge pressure on the street main during the day (or for the running pressure, on the service pipe with the water faucet one-quarter open) and convert the gauge pressure into hydrostatic pressure by multiplying the gauge pressure by 2.3. Then divide 33,000 by the hydrostatic head thus found, the quotient giving the number of pounds of water required for 1 horse power per minute. Divide the quotient by 8½ for gallons, or 62½ for cubic feet, to suit the method of water measurement. Multiply the last quotient by 600 for the working minutes per day, and the price per 1,000 gallons, or cubic feet, for the day's cost.

A single example for a 1 horse power water motor and water supply at 5 cents per 1,000 gallons, with a head of 50 feet (21.6 pounds pressure), and at double the head, will show the importance of high pressure in the purchase of water from water works by measurement for power purposes,

$$\frac{33{,}000 \text{ ft. lbs.}}{50 \text{ ft.}} = \frac{660 \text{ lbs.}}{8\frac{1}{2} \text{ lbs.}} = 79.2$$

say 80 gallons per minute, and 80 multiplied by 600 minutes per day is 48,000 gallons, which at 5 cents per 1,000 is $2.40 per horse power per day; from which the net power can be no more than eight-tenths of a horse power.

As the power is in direct ratio to the head or pressure for equal quantities, a head of 100 feet (43.3 pounds per square inch) will give 2 horse power gross for the above cost, or $1.20 per horse power.

Although this seems a very large cost where more than 1 horse power is required, and will not compete with a steam engine or a gas motor, it is with the very smallest powers required that the compensation in work may be equal to the cost. The many little wants under one-quarter of a horse power can well be afforded at the lowest prices of water by metre measurement.

In New York, where the water rate is 13½ cents per 1,000 gallons, the running of a 1-10 horse power motor will cost about 72 cents per day. In Philadelphia and Baltimore, 35 cents, and in Washington, D. C., 18 cents per day.

The charges for water by meter in the different cities and towns in the United States has a surprisingly wide range, being from 1.60 to 2½ cents per 1,000 gallons, the average for the whole being about 25 cents per 1,000 gallons.

Gas, gasoline and petroleum engines are now taking a strong lead for small and intermediate powers and are in actual use up to 50 and 100 horse power.

In a gas engine the consumption of gas varies somewhat with its quality and its nearness in use to the proper proportions with air for perfect combustion and best explosive effect, varying in practice within the limits of from 18 to 24 cubic feet of gas per indicated horse power per hour, or from 180 to 240 cubic feet per day of ten hours.

The proportion of air used with gas varies from 6 to 9 parts of air to 1 part of gas, the construction and adjustment of valve motion varying the quantities for best effect, 6½ parts of air to 1 part of good illuminating gas making perfect combustion. From this relation the cost of energy from the explosive power of gases, with a deduction of 10 per cent. for the larger sizes, and from 15 to 20 per cent. for the small sizes, from their indicated horse power, for engine friction, may be made by the price of gas in various places.

With gas at 75 cents per 1,000 cubic feet, 13½ to 18 cents per day; at $1 per 1,000 cubic feet, 18 to 24 cents per day; at $1.50 per 1,000 cubic feet, 27 to 36 cents per day per horse power; to which should be added incidental expenses, depreciation, interest and the necessary labor of attendance, ranging from 6 to 10 cents per day per horse power.

In most of our large cities where the price of gas is under $2 per 1,000 cubic feet gas engines of intermediate and small powers make a cheaper and more satisfactory power than steam engines of the same power. They require far less attendance, and afford a sense of security unknown to the users of steam power.

With gasoline and petroleum engines, every locality in the United States and other countries has a cheap, safe, and reliable means of obtaining power in small and intermediate amounts.

The cost of gasoline in different parts of the United States varies from 10 to 16 cents per gallon by the barrel. Any grade from .70 to .80 gravity may be used, and with about equal effect. The larger gasoline engines require somewhat less in quantity of fuel per unit of power, and, like other prime movers, have an inverse sliding scale of economy. Those of small and intermediate power consume from 1 to 1¼ pints of gasoline per indicated horse power per hour, costing at the prices quoted from 1¼ to 2 cents per hour per indicated horse power, or from 1½ to 2 4-10 cents per brake horse power per hour.

It is with petroleum engines, together with the low price of crude oil, that the greatest economy of other than the energy of nature has been obtained. From 1 to 1¼ pints of crude petroleum oil only is required per horse power per hour, and at the low price of from 2 to 5 cents per gallon in various localities the cost of power will range from one-quarter to seven-tenths of a cent per horse power per hour.

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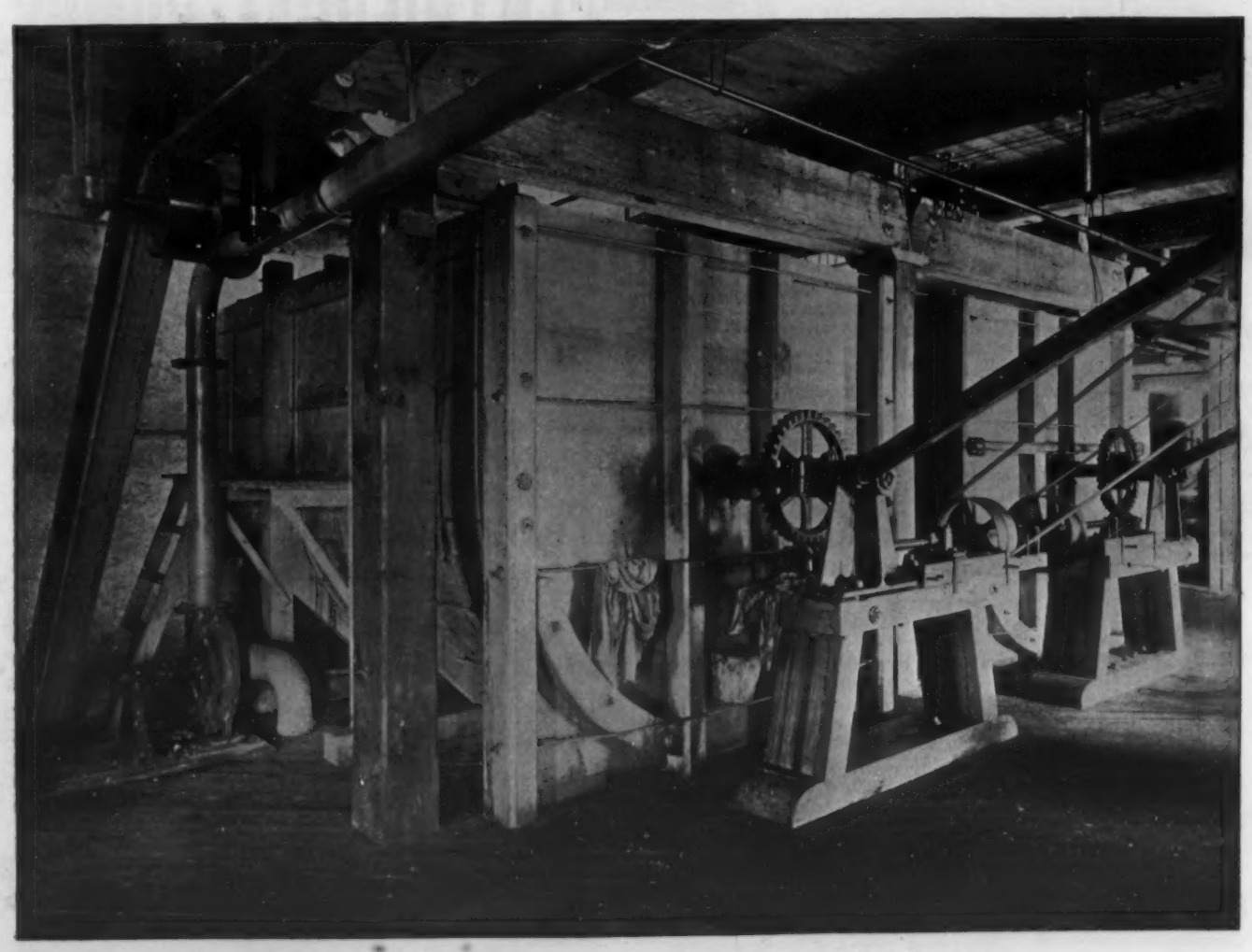

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line as the petroleum engine as to cost of motive energy. The sizes varying from one-tenth to 10 horse power are mostly in use. Like other prime movers. the larger are most economical in fuel, consuming from 3 to 5 pounds of anthracite nut coal per horse power per hour. The smaller sizes, used for pumping purposes only, consume about 1 pound of coal per 47,000 foot pounds of water raised per hour.

Windmills for all the purposes of power within their range of operation are taking a leading position in the United States, under the advanced methods of construction for stability and efficiency, there being fully 500,000 of these converters of nature's energy in daily operation in the United States alone. The American types are being sent abroad, and are fast gaining preference in other countries, even in Holland, the home of windmills.

The cost of energy is zero, and only the interest on cost of plant, depreciation, repairs, oil, and a trifling attendance is required in the total expense account. This ranges from 4 to 8 cents per horse power per day for a first-class windmill. It compares most favorably with all other prime movers within its scope of usefulness. For pumping water for farms, dwellings and small villages it is a most economical power; and for the storage of power by compressing air and the electric storage system, it is capable of furnishing a constant and reliable power for a full day's work of ten hours, from its intermittent work, averaging eight hours in a twenty-four hour day throughout the year.—*Power.*

Smoke,*

By W. H. Blauvelt.

What is smoke, and how is it formed? Although smoke in general may be composed of a large number of gases, vapors and finely divided solids, we are considering only the smoke from bituminous coal; this may be defined as that portion of the products of combustion of the hydrocarbons in the coal which is visible, namely, solid carbon in a finely divided state, or soot, and volatilized but unburnt hydrocarbons.

Many hydrocarbons, when heated to suitable temperatures, are decomposed, with formation of a new hydrocarbon and solid carbon in a fine state, which, unless there is present a supply of air at a proper temperature for its combustion, passes off as soot. Smoke may also be formed by hydrocarbons while in combustion striking against a cool surface, which lowers the temperature below that at which combustion can be sustained, and the flame is "put out," with the production of smoke as the result.

A third cause is the distillation of the hydrocarbons without alteration or even partial combustion. It is this that gives the yellow tinge to smoke, and the greasy quality, which is one of its most disagreeable features. From the point of view of thermal economics the formation of smoke is not of such serious importance as many imagine. In ordinary cases the actual loss of combustion amounts to but a small percentage of the energy in the coal; in its denser forms it is important because it is the indicator of seriously imperfect combustion, and because carbon is visibly wasted. The attempt should be, therefore, to prevent its formation rather than to "consume" it, at the expenditure of mechanical or thermal energy.

The causes for the formation of smoke serve to indicate the means for its prevention. The deposition of solid carbon from decomposed hydrocarbons, and the escape of unburnt volatilized hydrocarbons may both be prevented by their intimate mixture at the moment of combustion with the proper amount of air, preferably preheated, so that each particle of carbon or hydrocarbon may find oxygen adjacent to it for its combustion. The "putting out" of the flame by its contact with cold surfaces may only be overcome by permitting the combustion to be nearly complete or at least thoroughly established before the gases are allowed to impinge upon the boiler shell or other cool surface. While it is very difficult to carry out these conditions with solid fuel, gas easily lends itself to them, and by their proper application all smoke can be prevented from gas fired boilers. The mistake usually made in applying gas to boilers is the attempt to imitate the conditions of a solid coal fire, it being forgotten that the gas is employed in order to overcome weak points essential to the use of solid fuel.

In some applications of gas recently made to return tubular boilers, by the writer, a careful use of the above principles in the light of previous less successful experience resulted in the prevention of all smoke and in an increase of the evaporative capacity of the boilers of over 12 per cent. as compared with the results from the same coal burned on the grate. At the same time there was a saving of about 15 per cent. in the amount of coal used. The air for combustion was not preheated and the temperature of the waste gases was 700° or more, as the boilers were too short for the most economical work. Had hot air been used of course this high stack temperature would not have been a source of serious loss.

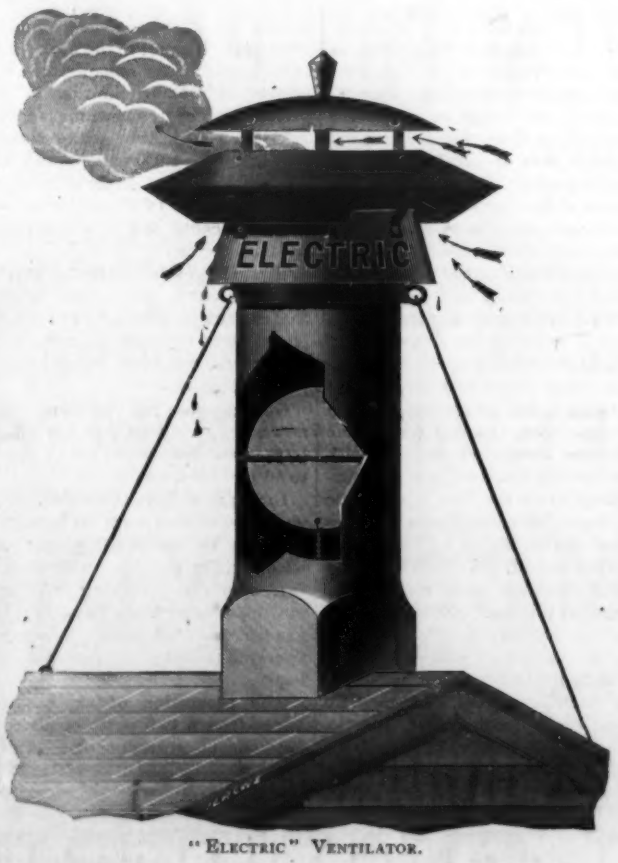
The mixture of the gas and air was made as prompt and perfect as possible by a special arrangement of the parts, and inflammation was thoroughly developed in a brick chamber below the boilers. This was so arranged that but little more than the products of combustion reached the shell of the boiler, and at the same time the temperature at which combustion took place was kept high by the reflected and radiated heat from the walls of the chamber. For successful boiler firing it is essential that the mixture of gas and air should take place as soon as possible after they enter the combustion chamber. Frequently they are introduced in parallel streams, but even if these streams are small, the gas and air often travel quite a distance with but little mingling of the currents.

* Abstract from a paper read before the Engineers' Society of Western Pennsylvania.

The "Electric" Ventilator.

The illustration given herewith shows the design of the "Electric" ventilator manufactured by the White & Ennis Cornice and Roofing Company, Troy, N. Y., and the method of mounting it on a galvanized iron pipe fitted on a wooden curb on the ridge of a roof. The pipe extends high enough to prevent winds deflected by adjacent buildings from interfering with the operation of the ventilator.

This device is the result of study of other applications of like nature and is believed to embody the good points of these, with other new features of utility. The ventilator consists essentially of a hood extending over a pair of double cones, within which the ventilating pipe is placed, the mouth being protected from adverse winds or storms. A damper weighted so as always to remain open, except when closed by a chain, is placed in the inside of the pipe. Guys extend from the ventilator to the roof. The arrows show the currents of steam escaping from the ventilator, assisted by the wind. The curb is built square to fit the lower end of the galvanized iron pipe and may be from 15 to 18 inches high. The inclined sides of the double cones act on the outside to facilitate the action of the wind, and on the inside assist the escape of steam or foul air. Any snow or ice that may fall on the outside will readily pass off, and any condensation that collects on the inside will find an easy escape. A strong framework of wrought iron holds the different parts together.



"Electric" Ventilator.

The form of this ventilator is such that in any direction the wind blows, an exhaustion of the ventilating pipe is produced. Another important feature is the large area of opening for the escape of heated air. This is a very desirable feature, especially in summer when the air is still. As there is at all times a thorough circulation of air through all parts of the ventilator, and a perfect system of drip and removal of condensation, it will last a long time.

The manufacturers set forth the following claims to superiority for this device: Large ventilation area; controls the wind perfectly from all directions; removes all drip and condensation; strongest in construction; exposes the largest superficial area to the action of the wind; ornamental in appearance; reasonable in price; will outlast all other ventilators.

Strong testimonials to the efficiency of the "Electric" ventilator, after years of experience, are given by the Lawrence Paper Company and the American Straw Board Company.

Department of Labor Report on Strikes.

A Washington press dispatch says: "The Department of Labor has about completed its investigation of strikes and lockouts that have occurred since 1887, upon which it has been engaged for many months past. This report will not, however, be published before next spring. It will form an exhaustive showing of all labor troubles in the United States since the date named, the number of employees involved in each strike or lockout, the cause of the trouble, the loss in wages, &c., the investigation being covered by about thirty questions.

"The next subject to be investigated by the Department is the influence of machinery on labor. Congress has appropriated $10,000 for this, besides authorizing the use of the regular force of the bureau. The work of the inquiry will begin in November. The field force will be put upon it as soon as they complete their work on strikes and lockouts. The statistics of strikes and lockouts will be kept from year to year hereafter. The inquiry on the influence of machinery on labor is a vast and complete subject, and one that is involving the best thought and greatest interest of the department. The growth of machinery and its use will be looked into. An elaborate comparison of the cost of commodities under the old hand system and under the machine system will be made. The relative productiveness of labor under the two systems will be shown, and comparisons of wages under the two systems will be made.

"Beyond this, a resolution of Congress calls for an investigation of the modern industrial condition of women and children, the wages that are paid them as compared with men, how far their labor displaces that of men, the sanitary conditions under which they labor, and the provisions for their comfort, &c. There is no special appropriation made for this inquiry, and it is expected to be made out of the regular funds of the department. It will not be entered upon until after the inquiry into the influence of machinery on labor is completed, which is expected to occupy a year or more."

A British contemporary recommends the following method of removing boiler scale: For a few days before the removal of the scale is to be undertaken introduce into the boiler a liberal quantity of ordinary soda. Then draw the fire, open all valves, and when the steam has blown off uncover the manhole. Open the blow-off cock about one-fourth and admit at the same time cold water, so regulating its admission that the water stands as high in the gauge glasses as under ordinary circumstances. By this means the boiler will be gradually cooled. The deposit will be found at the bottom of the boiler, in the form of a slime, and only requires to be swept out.

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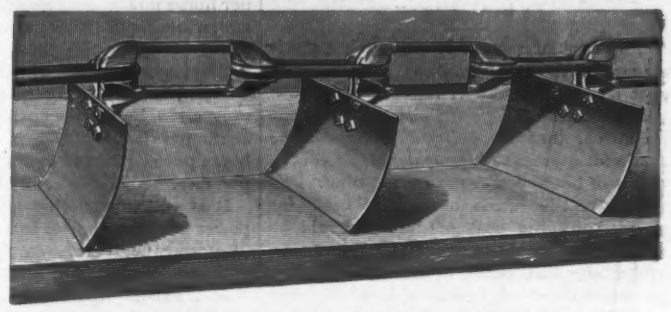
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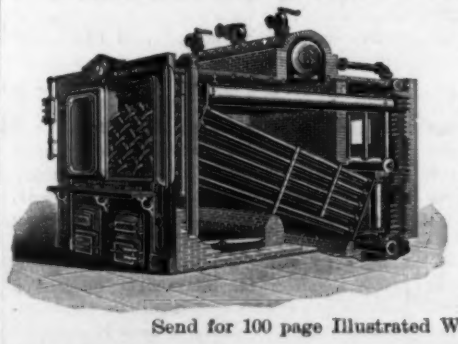
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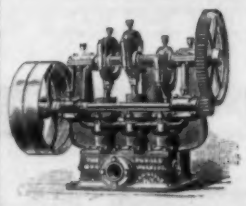
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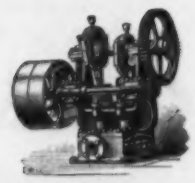
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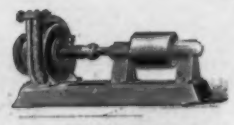
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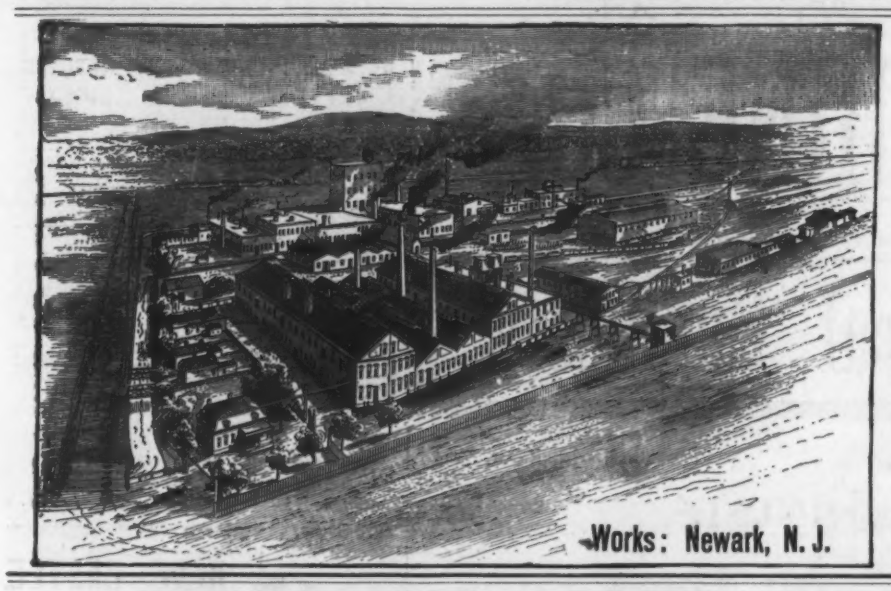
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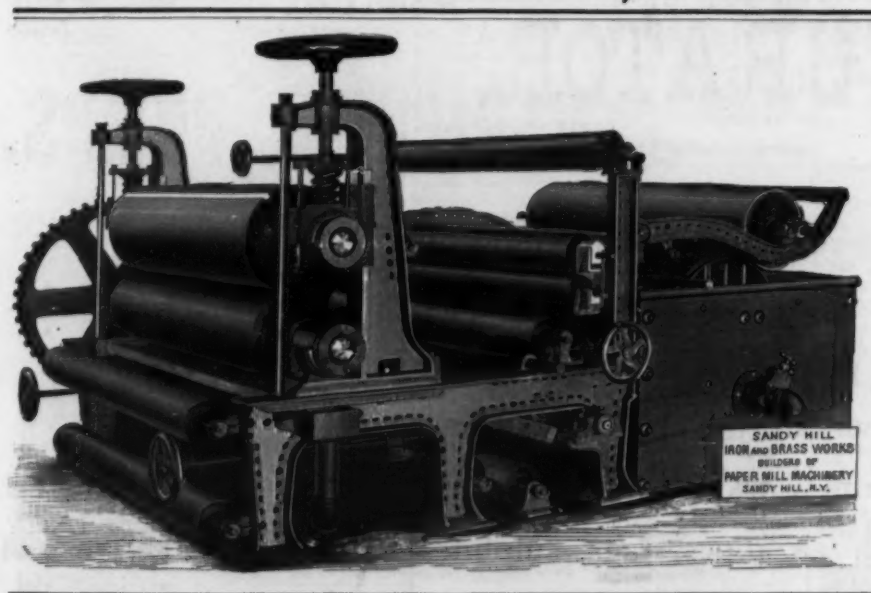

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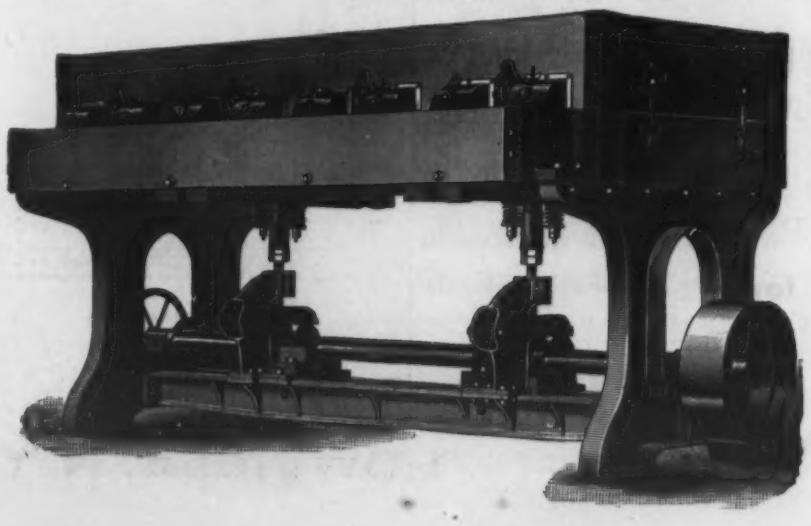

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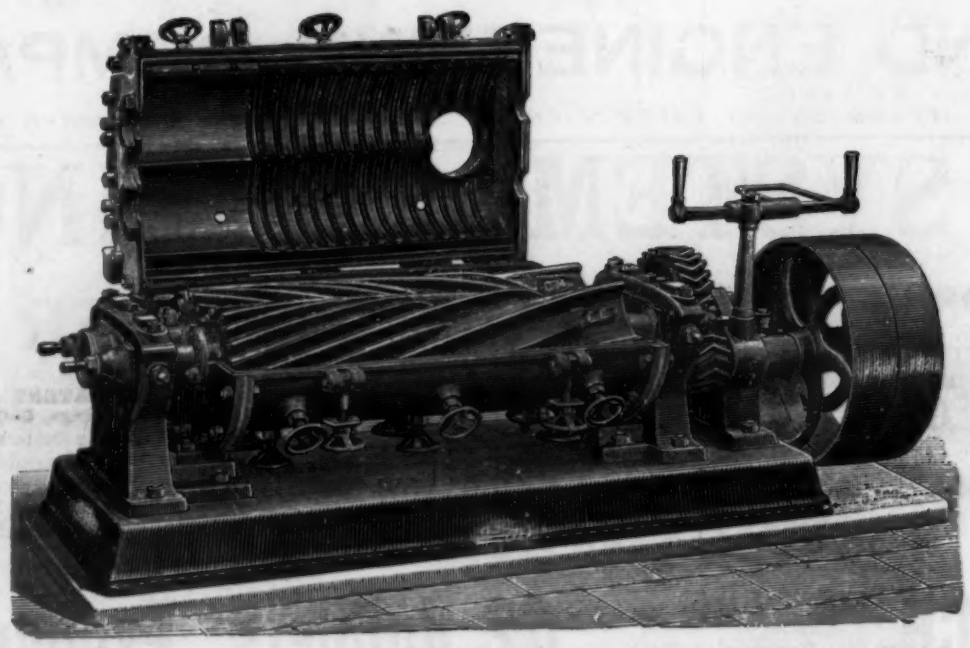

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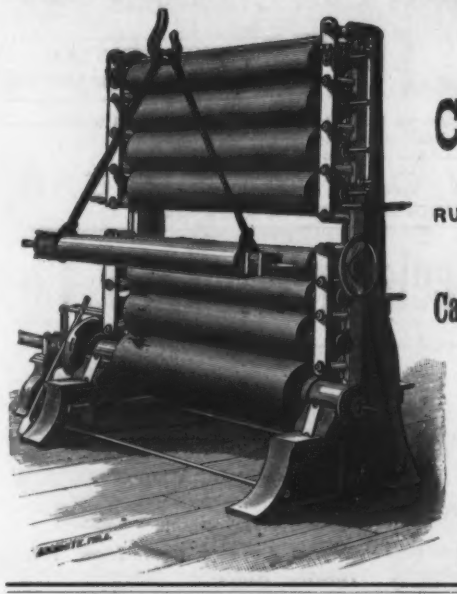

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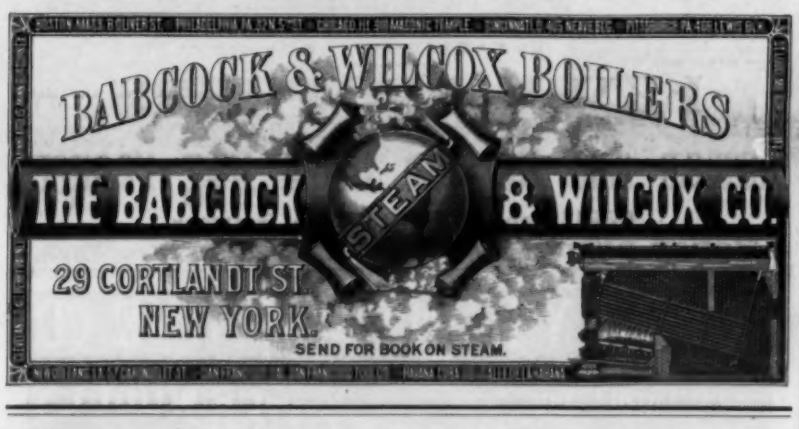

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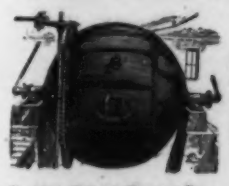

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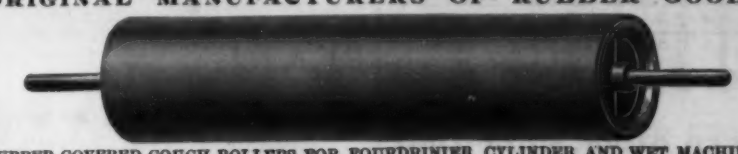

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Mr. Hofmann returned to Germany more than eighteen years ago and settled in Berlin. He established *The Papier Zeitung*, and in due course, about seven years ago, began to write his second and latest Treatise. Thus far he has printed and published probably 1,200 pages in German, and in parts of forty-eight pages, including cover, profusely illustrated by wood cuts. When finished the book will consist of about 1,600 pages (pages size same as in first book), illustrated by 1,500 wood cuts.

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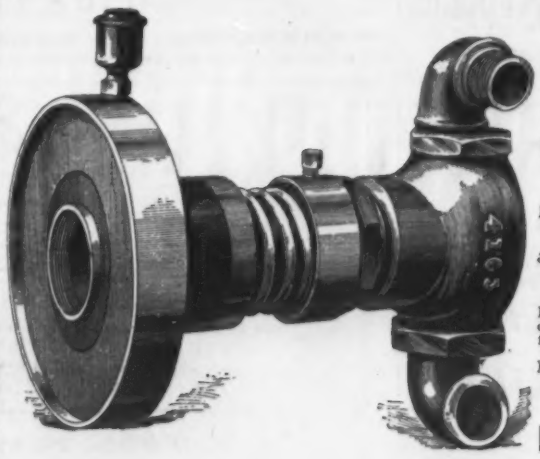

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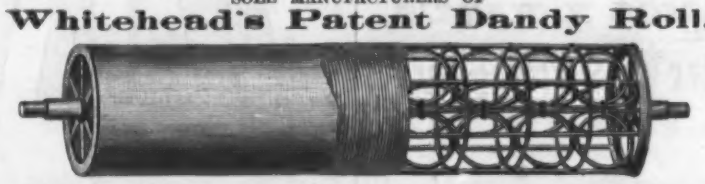

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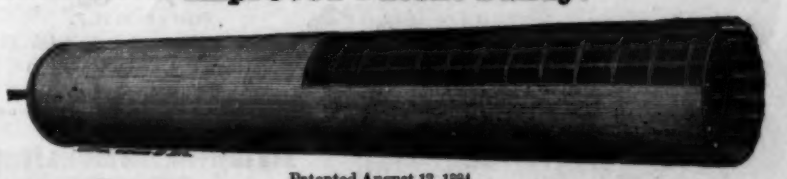

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